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The
CHEMICAL AGE

VOL LIX | 17 JULY 1948

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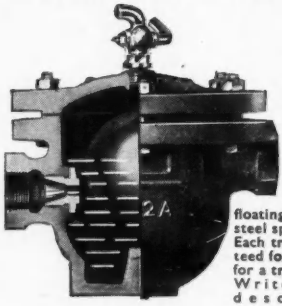

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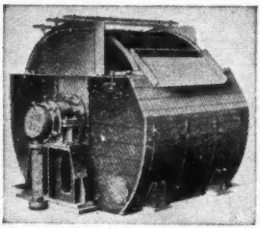

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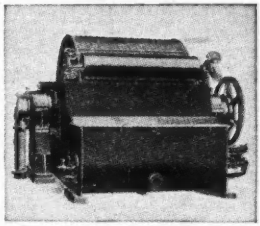

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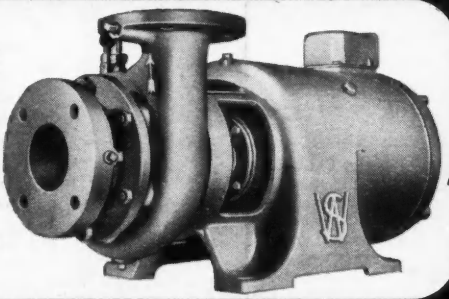

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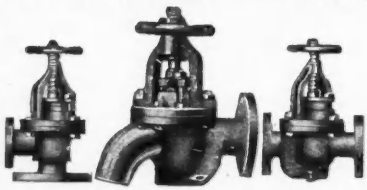

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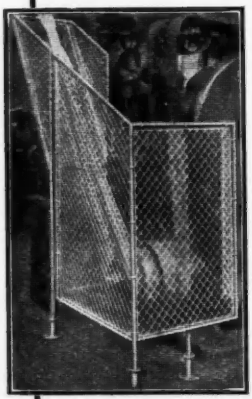

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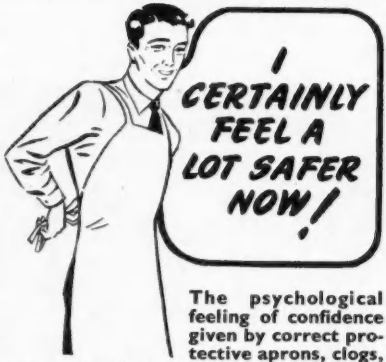

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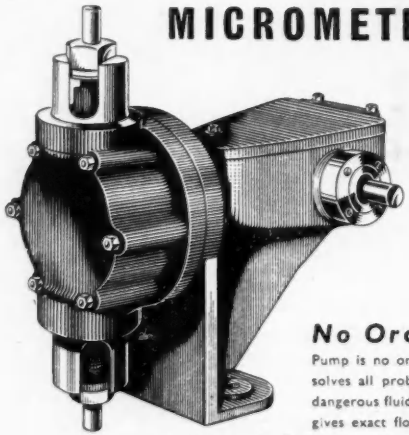

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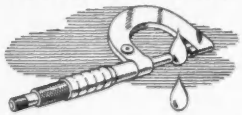

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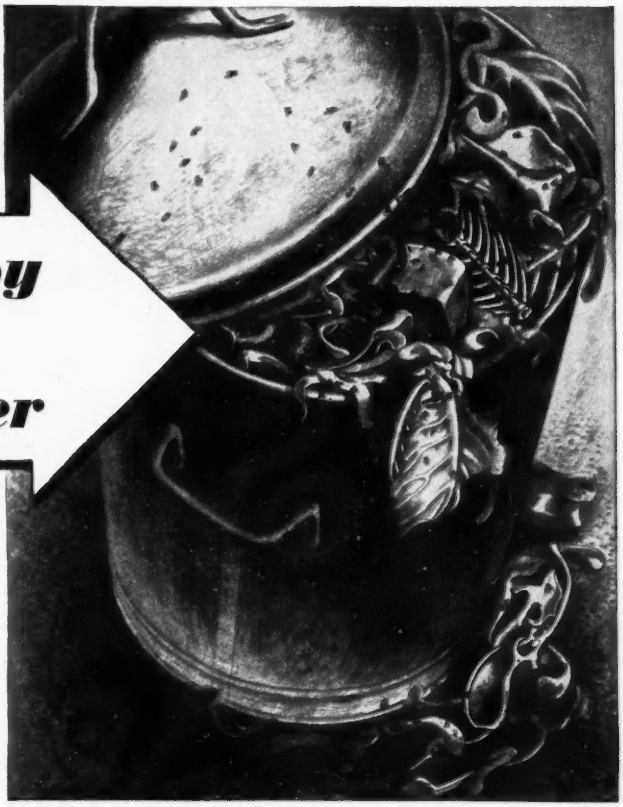

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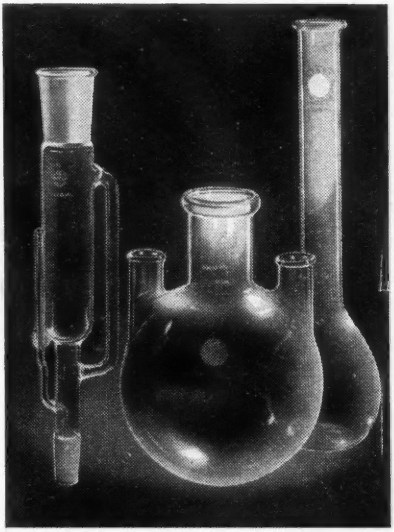

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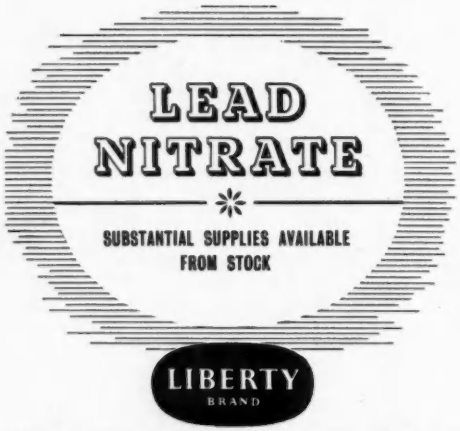

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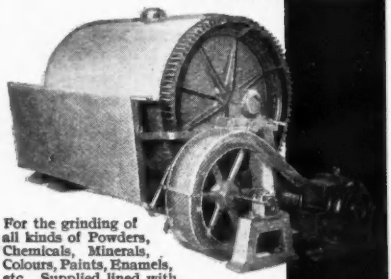

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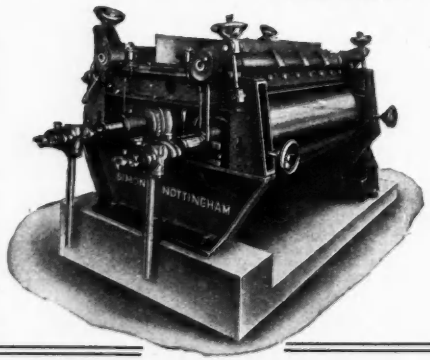

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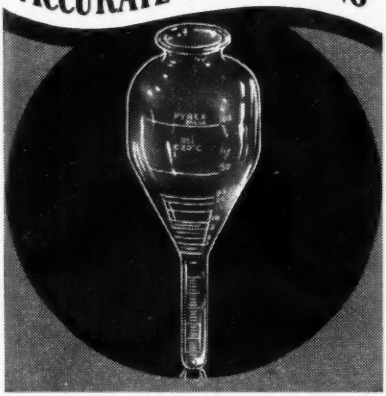

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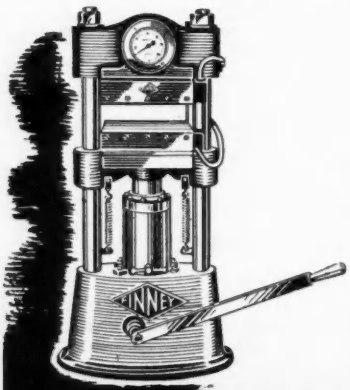

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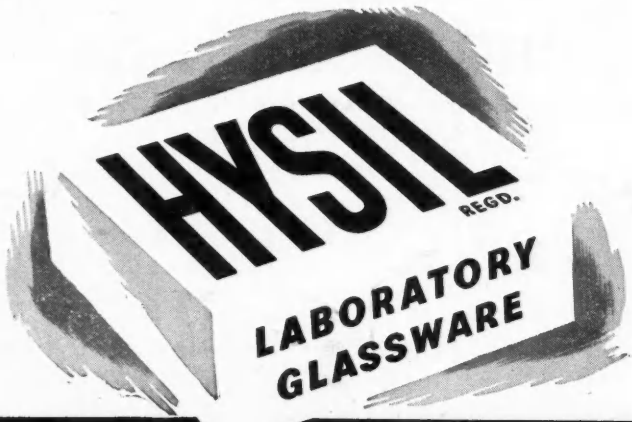

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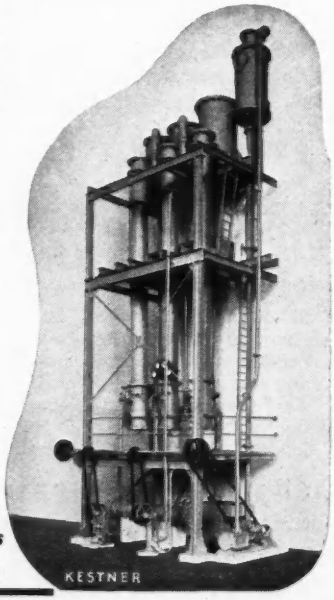

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THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers Limited

VOL. LIX
No. 1514.

17 July 1948

Annual Subscription, 26s.
8d. per copy; post free, 10d.

Oil from Africa

AMONG the measures taken by the present Government, few have more theoretical justification than that of growing groundnuts on 3 million acres of tsetse-infested bush in Tanganyika. At a time when the world is short of food, it has been widely agreed in these columns and elsewhere in recent weeks that a project to turn this vast area of fertile Africa into an agricultural estate to provide much-needed oils appeared to be a master stroke. It is a thousand pities that the project now seems to have been carried out without due thought and plan, leading both in this country and in Africa to a general sense of disquiet and apprehension.

The seriousness of this is magnified by the activity now being shown by the Colonial Development Corporation, under the chairmanship of Lord Trefgarne, and the knowledge that upon the efficiency of its schemes in the practical sphere depends the fate of potentially a great increment of the raw materials of chemical industry. Very large sums of public money also are involved. Before 1950 ends, this corporation expects to spend not less than £20 million on some 20 or 30 Colonial projects unrelated to the Tanganyika scheme—in addition to the heavy annual expenditure for which the Colonial Development and Welfare Act provides. One of these projects also is concerned with groundnut cultivation, on the African Gold Coast, and calls for the expenditure of £1 million at once and probably of £20 million more in the next few years.

Ostensibly, the magnitude of what is being planned in these various locations should make certain an addition to our vegetable oil supplies large enough to free us to an appreciable degree from the thrall of monopolists outside the Commonwealth. Lamentably—judging by what has been reported from Tanganyika—there seems to be no certainty of that, nor yet much assurance that the millions sterling being made available will yield an adequate return in kind in reasonably short time. The danger arises very largely from the fact that politicians concerned with these schemes seem incapable of realising that in industrial matters it is not enough to wave a hand, as when addressing a non-technical audience, but that scientific facts must be placated or they will destroy you.

The Tanganyika scheme has already been voted £25 million by Parliament. It does not seem that this amount will be anything like sufficient. The costs of land reclamation and of developing the land so reclaimed are far greater than had been estimated. Moreover, the £25 million does not include the new roads, railways and harbours that are necessary if so large an area as 3 million acres is to be developed. The initial cost of the project is threatening to be out of proportion to any advantage that will accrue to this country.

Little, if any, of this criticism can fairly be directed at the men on the spot. From all accounts they have done a good job of work in clearing the first 7500 acres, under many unforeseen difficulties, and in

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planting that area with nuts. It is the basic planning of the scheme that is at fault, and has resulted in the intial cost being so greatly under-estimated.

Even a Government that cheerfully allows a nationalised coal industry in Britain to lose more than £20 million in a year must think deeply before embarking on an expenditure in equatorial Africa that is certain to be a good deal greater than £25 million.

The Government, committed to nationalisation and to huge State Corporations, has carried that principle into the ground-nut scheme. It has discarded the United Africa Company, a private concern with immense experience in plantation management, in favour of a State-run corporation, regardless of the fact that such a body is most ill-adapted to run successfully three vast estates totalling 3 million acres and separated by hundreds of miles. Lord de la Warr, who has lately visited the territory, has returned to advocate the adoption of much smaller holdings of about 5000 acres that can be farmed with mechanised plant let on long lease to approved individuals who would be risking their own money.

It must not be forgotten that it will be impossible to grow the one crop only; that way lies soil erosion and in the end another dust bowl with the desert spreading over all. Crop rotation is essential and is in fact foreseen by experimental work now in progress at Kongwa. That means that nothing like the full yield of oil will be secured from 3 million acres. A great deal of food will be grown that will never leave Africa; it will be used in raising the standard of living of the natives. That is wholly admirable. But can we afford it just now?

Italian Chemical Council

PROGRESS in development of UNICHIM, the newly formed organisation intended to secure closer collaboration of all chemical organisations and individual undertakings, is reported from Italy. Among its objectives are "to co-operate with all chemical organisations of Italy and of other countries and to participate eventually in any initiatives favouring chemical industry in any manner." The number of votes allotted to a member will depend upon the size of his financial contribution. The first council of the new institution is as follows: President, Dr. Luigi Sessa; members: Dr. C. Bagno (Italgas), Dr. R. Frisacco (Montecatini), Mr. E. G. Salice (Rumianca), Dr. G. Marzi (Caffaro), Dr. G. Tremi (Solvay), and Prof. G. Pastonesi (A.N.I.C.).

NOTES AND COMMENTS

SCI in Edinburgh

FAVOURED with the prospect of hearing original papers by acknowledged experts, the unusually large following which the 67th annual meeting of the Society of Chemical Industry drew to Edinburgh at the beginning of this week has had an unassailable alibi for flying from the rigours of July in England. While conditions in North Britain have been something less than tropical, there seems to have been general agreement that the move to the north was a prudent one, particularly in the interest of the varied programme of social occasions, which is not the least important part of the annual meeting. One of the most warming of the non-scientific proceedings was the presentation at the annual general meeting on Wednesday of a ceremonial gavel, sounding board and casket, as a token of the affectionate regard in which the society is held by one of its many distinguished members overseas. The donor, Dr. Wallace P. Cohoe, New York consulting chemist and former president of the society, was also the fabricator, using as material a charred beam from London's blitzed Guildhall, shipped to him by the retiring president, Dr. L. H. Lampitt.

Atomic Deadlock

THE inability to see any immediate means of bringing about a peaceful and permanent cure of the atomic bomb neurosis is a failing not confined to the great uninformed. The Atomic Scientists' Association, which has devoted closer attention to this problem than have most of us, seems to be no more capable of foreseeing a happy ending—or of averting the possibility of an explosive one. This is evident in the official statement of the views of the council of the association, which has just been circulated, in which the lamentable descent, since the association began in 1946, from comparative confidence that sanity would prevail to the hope in 1948 that the worst may still not happen. After giving a well-balanced review of the steps which have been taken to secure peaceful agreement between the nations and of the psychological impediments on which each has stumbled, the council " sees no hope of an early agreement . . . and believes that the solution can now be sought only through the constant promotion of all measures designed to make war less likely and to reach a settlement between the East and West."

The association also affirms its disbelief that the use of the bomb could bring a permanent solution tolerable to the peoples of the West nor yet confer immediate victory to any side. On that point the report is concerned almost entirely with negative results. The only positive contribution is its own, a reaffirmation of its unwavering belief in the virtue of collaboration between scientists of all nations, and in particular of the importance of maintaining and improving contacts between scientists of Eastern Europe and those of America and the West. Could it have thrown any light on how friendly collaboration with the East might be achieved this would have been a hopeful document—which it is not.

Verdict on a State Industry

THE propensity of nationalised industries for operating at a loss is a phenomenon not peculiar to this country, although the discouraging confirmation that the United Kingdom's expensive and not over-productive collieries have incurred a loss of more than £20 million in 1947 is giving us an uncomfortably intimate demonstration of the fact. Whatever is achieved in Russia is so shrouded in official secrecy and propaganda that the average Soviet citizen appears to be as much in the dark as we are; in Turkey, however, where much of the minerals are disposed by the State, facts and figures are still available. The comprehensive report lately issued by the Export Promotion Department of the Board of Trade is proof of that and it casts a revealing light on the operations of the State-owned mining organisation, the Eti Bank, which controls, among others, coal, copper, iron, gold and silver. It is true to say that almost every one of these State mineral activities is in a moribund condition because of its inability to produce materials, many of which are in urgent demand around the world, at an acceptable price. There are, of course, special difficulties associated with

the mountainous Turkish terrain and the interruption of activity in accustomed commercial channels caused by the war. But the Board of Trade survey seems to be in no kind of doubt where the main impediment lies. It makes perfectly clear that in its opinion until private enterprise is permitted to compete with the Eti Bank operating costs will continue too high to permit Turkey's mineral products to compete in world markets. It is tempting to speculate what would be the verdict were the Board of Trade to make a similarly disinterested survey of some nationalised industries nearer home.

A Technical Win

AMERICAN industry, more lavishly armed with patent processes and research institutions than any other, figures now as a giant of technology. It is the more refreshing to hear there are chinks in the giant's armour. Sir Graham Cunningham, describing to THE CHEMICAL AGE on his return from the U.S.A. what he observed in a far-ranging inspection of transatlantic scientific glassware, indicated several directions in which the best practice here is more advanced. As chairman of Triplex Safety Glass and Quickfit and Quartz, he had reason for gratification in finding that some of the technical matters in which his own companies have gone far have no true counterpart over there. American makers of technical glassware have, for example, paid little attention to standardised and fully interchangeable components (so that any of a dozen stopcocks in the same category will fit as well as another) and to the production, in glass, of heavy chemical piping and processing plant. It is gratifying, at least in the latter connection, because supplying this deficiency may usefully supplement our dollar supplies. The production and use of glass piping of conventional types is, of course, lavish, but America has not yet developed the technique of producing "tailor-made" glassware, designed, and sometimes made, by chemists for the special needs of chemists. We have in fact not very much to learn, it seems, from this particular section of the glass industry—unless it is the secret of producing at a rate which justifies payment to ordinary glass workers of $1.5 an hour (about 7s. 6d.) . . . and of procuring all the raw materials required to support production on the vast scale they have attained.

Realities or Theories?

A TRENCHANT reminder that underlying all the economic and sociological controversy of the ephemeral kind is a much more fundamental rift of opinion is conveyed in an article sponsored by the Society of Individualists and written by Sir Ernest Benn, whose presentation in the past of what can be conveniently dubbed "the case for capitalism" has been accepted round the world as the liveliest exposition that subject has received In contrast with the optimistic utterances of political theorists, Sir Ernest Benn discusses our economic plight with realism. "Capitalism," he declares, "will not put things right to-morrow or next year, or even for a generation; it would start things in the right direction and no higher claim should be made for it. One might as well talk of 'trying' arithmetic, or of 'trying' morality, as of trying capitalism. There is in fact nothing to try for we know all about it; we have at our disposal every detail of 150 years of the state of economic liberty which has come to be known as capitalism. Starting with conditions very near to barbarism we achieved, in freedom, the highest standard of living ever known in any country at any time. . . . It is easy to turn the electric light on to the actions of our forebears who had nothing better than a paraffin lamp, but to do so is merely silly. They moved on from the paraffin lamp to the fishtail gas burner and nothing better could then be done." Maintaining that our choice between planned bondage or the freedom associated with a personal responsibility and action is a matter of ethics rather than economics, Sir Ernest poses this question: "Is man to continue as the image of his Maker, or can he be delivered out of a test tube in a government laboratory and kept going by atomic energy, generated to the order of UNO?" The doubter, he suggests, should read Aldous Huxley's "Brave New World."

British Tar Offices.—The administrative offices of the British Tar Confederation have been removed to 9 Harley Street, London W.1. (Telephone Langham 1778).

MORE INVISIBLE EXPORTS

New Methods of Surmounting Trade Barriers

THE increasing practice, particularly in the chemical and associated industries, of the international exchange of patents and the opening, by parent firms, of new factories in countries where import markets are beset by permit and currency difficulties, formed the basis of an address delivered by Mr. H. S. Sutherland (Shawinigan Chemicals, Ltd.) at the annual meeting of the Canadian Manufacturers' Association.

The speaker pointed out that, in common with other trades, the chemical industry was confronted with the same export problems concerning licences, high freight rates, currency regulations and tariff barriers, but in its high level of technical skill it possessed an asset which could easily be utilised to alleviate many of these difficulties. The licensing of patents abroad, if done with prudence and economic skill, could produce guaranteed revenues over a long period of years without seriously affecting the general export trade.

Necessary Safeguards

In arranging this "invisible export of technical skill," said Mr. Sutherland, several factors must be taken into consideration. The leasing or outright sale of patents into foreign hands must not be so indiscriminate as to completely jeopardise the existence of established markets, although a certain reduction in the volume of exports was only to be expected. The fees received from foreign licencees, should, however, compensate for actual export losses. Another point which needed careful attention was the possibility of technical efficiency, in the form of the patent, falling into non-revenue producing channels. This was a most undesirable situation because, in addition to financial loss incurred by the proprietor of the patent, the fruits of costly and laborious research could be wilfully withheld in order that other and probably less efficient processes could take precedence.

Branches Abroad

Another and equally satisfactory method of creating invisible exports, Mr. Sutherland considered, was to establish a branch factory in a foreign country. In this case technical processes were merely transferred from one country to another and financial returns came in the form of dividends.

An important advantage of this method lay in the fact that control was still administered by the parent company. There were, however, several disadvantages to be considered. Large amounts of capital must be transferred and immediately became dependent upon the economic and political fortunes of the chosen country. In addition, there may be a severe drain on the research staff at headquarters with perhaps a corresponding drop in the efficiency level at the home factory.

Currency difficulties and taxation could also offset to a considerable degree the initial advantage gained by the transfer.

Foreign Partnership

The speaker outlined a third method of exporting technical "know-how." This was to link up with some competent foreign manufacturer to form an entirely new company. Very little, if any, capital needed to be contributed by the possessor of technical knowledge in this case. The patent royalties could be accounted as shares in the new organisation and the risks connected with the previous methods were somewhat modified.

The question may be asked, Mr. Sutherland concluded, whether, in view of the financial benefits resulting from the mere export of research knowledge, large laboratories could not take the place of chemical plants. The answer, of course, was that, while such laboratories laid the foundation of patent processes the latter were perfected only after years of trial and error in large-volume production.

U.S. FACTORIES IN EUROPE

MR. PAUL HOFFMAN, E.R.P. administrator, announced details last week-end of a plan whereby U.S. industrialists will be permitted to spend £75 million in establishing factories in Britain and other European countries. Mr. Hoffman described the scheme as "a substantial inducement to American capital to seek profitable employment abroad."

The scheme is authorised under the European aid programme and the U.S. Government will offer American firms a 14-year guarantee that their foreign currency earnings will be converted into dollars. Mr. Hoffman said he desired applications for such guarantees to be sent to him as quickly as possible, so that he could estimate the volume of investment and find out each country's reaction towards the entry of American capital. No guarantee of profits is provided.

Athole G. Allen Sells Plant

"A Lifetime's Work Chopped Up"

WHEN chemical plant and machinery at the works of Athole G. Allen (Stockton) Ltd., came "under the hammer" at a four-day sale held last week, Mr. A. G. Allen, chairman and managing director, said he would not be present because he did not wish to see "a lifetime's work chopped up."

Last February the firm announced that owing to uncertain supplies of raw materials and frustration and delay in the company's efforts to use a substitute, future production would be confined to ground baryites and the mining of baryites. That decision meant the immediate dismissal of 100 men.

Mr. Allen described last week's developments as "a step towards self-preservation."

Breach of Faith Alleged

Following the sale, Mr. A. G. Allen, managing director, alleged that the Ministry of Supply had divulged confidential information about chemical processes to other chemical firms. He alleged that there had been unfair competition resulting from the Ministry of Supply's disclosures of barium chloride processes, of which, he said, until two or three years ago, his firm was the only producer in this country. He alleged that if the Ministry had done its job as administrator, instead of discriminating in favour of trade organisations which Athole G. Allen had refused to join, the Stockton plant could have continued.

(The firm was started in 1928 on the site of the old Stockton Chemical Works, which had been derelict since the Great War.)

POWER CUTS NEXT WINTER

PLANS for the spreading of the electricity load next winter were announced last week by the Ministry of Labour. They seek to provide for a 20 per cent reduction in industrial demands during peak hours (8 a.m.-12 noon and 4-5.30 p.m.) throughout December, January and February.

In October, November and March, when the problem is less acute, arrangements will be worked out by the Regional Boards for Industry in the light of local circumstances in collaboration with the British Electricity Authority.

A report presented by the Electricity Sub-Committee of the National Joint Advisory Council says that the estimated increase in generating capacity will not in itself afford any alleviation to the problem in the coming winter.

Effective Ore Research

May Lead to Higher Output

SUCCESSFUL application of methods of improving the sinter, a mixture of Lincolnshire and Northamptonshire ironstone, were announced last week by the Appleby-Frodingham Company, Scunthorpe. The result of research by the firm's technical staff, the new process may produce a substantial increase in the company's steel output.

Local desposits of iron-stone contain only 20 per cent of ore and shortly before the war the company installed an elaborate pre-preparation plant to improve the quality of blast-furnace materials. It is in this special plant that the firm's research workers conducted the experiments which led to the new process.

New Furnaces Unnecessary

Plans for the erection of two new furnaces have now been temporarily shelved because the company is confident that the expected production increase from existing plant will exceed the year's target.

By the end of the year more than £3 million will have been spent on new construction and replacements at the Appleby-Frodingham works as part of a £168 million development plan.

Present output has now reached an annual rate of 845,000 tons of steel and 795,000 tons of pig-iron.

Franco-German Chemicals

Countries Collaborate to Form New Company

A FRANCO-GERMAN company with an initial share capital of 500,000 deutsche marks, of which 70 per cent has been provided by French and the remainder by German interests, has recently been registered in Säckingen in the French zone of Germany under the title Chlorbetriebe A.G. The immediate object of the company is to take over the Rheinfelden-Baden works of the I.G. Farbenindustrie, which have been renamed, some 18 months ago, Electrochemical Works Rheinfelden. The Chlorbetriebe A.G. is said to have concluded a 30-year's lease agreement with the Allied custodian of the works.

Although the Rheinfelden works of the I.G. are the smallest I.G. unit in the French zone, it represents a very appreciable asset, having its own raw material in the form of salt deposits and being able to use hydro-electric power from the Rhine. Demand for the two main products of the Rheinfelden-Baden plant, chlorine and alkalis, is assured for a very considerable period.

BASIC CHEMICALS IN APRIL AND MAY

Steady Increase in Total Production

VERY substantial increases in production of several of the basic materials of chemical industry are recorded in the issue for June of the Central Statistical Office's *Monthly Digest of Statistics* (HMSO, 2s. 6d.). The returns relate in a few cases to the month of May; most of the available records, however, are concerned with April.

One of the most marked improvements was recorded in the figures for molasses production, the total in April for cane-derived molasses reaching 11,800 tons, substantially the largest result recorded in the past two years, during which average output has been approximately 2000 tons less. There was, however, a very heavy seasonal reduction—to 400 tons—in the total of beet molasses.

Increased Fertilisers

Production of all types of fertiliser maintained the fairly continuous increase which has been achieved since the beginning of 1947 and one or two categories showed largely improved totals in April. Superphosphate, for example, totalled 113,700 tons, compared with the general level, some 5000 tons higher than the average monthly return in the past two years. Compound fertilisers almost maintained the exceptionally high tonnage first reached in March, exceeding 185,000 tons. Sulphuric acid was produced (in May) on a somewhat smaller scale than during the first three months of the year, but the total of 129,100 tons is more than 13,000 tons larger than in May, 1947. Consumption, as of most other basic materials, continued the steady increase which has been manifest since the end of the war.

Canadian Salt Production

Canada produced 56,756 tons of common salt in February compared with 54,381 the previous month and 59,845 tons in February, 1947, the Dominion Bureau of Statistics reports. Salt shipments in February totalled 54,083 tons compared with 55,975 tons in January and 42,715 tons in February last year, while imports were 5449 tons against 15,859 tons a year ago, and exports 561 tons compared with 157 tons.

Chemical Trade Golf

The Chemical Trade golf competition, held at Formby on July 2, attracted competitors from a large number of firms engaged in the chemical industry. The Sir John Brunner Challenge Cup was won by G. L. Whyte (handicap 12), who returned a net score of 71. For the sixth year in succession, E. C. Tweedle returned the best scratch score of 77. The Rayner Memorial Team Prize was won by the synthetic ammonia and nitrates team, with an average of 83.1. The afternoon foursomes competition was won by A. R. Legard and J. D Frame.

PRODUCTION AND USE IN APRIL AND MAY

	April, 1948 Thousand Tons			April, 1947 Thousand Tons		
	Production	Consumption	Stocks	Production	Consumption	Stocks
Sulphuric acid	129.1†	140	57.3†	115.8†	115.0	66.4†
Sulphur	—	21.5†	89.1†	—	18.2†	79.2†
Pyrites	—	19.2†	73.0†	—	16.9†	89.0†
Spent oxide	—	16.3†	167.5†	—	15.3†	145.1†
Molasses	12.2	27.9•	187.9	7.1	32.2•	133.5
Industrial alcohol (mil. bulk gal)	1.81	2.84	5.96	2.26	2.44	4.20
Superphosphate	113.7	142.5	39.0	91.3	136.6	107.0
Compound fertilisers	184.7	230.8	31.4	130.4	252.6	83.7
Agricultural lime	—	413.3	—	—	114.1	—
Ammonia‡	—	6.06†	5.07	—	5.96†	3.60
Phosphate rock (agricult.)	—	85.1	157.6	—	70.7	112.7
Phosphate rock (indus.)	—	6.70	43.4	—	3.89	34.6
Virgin aluminium	2.62	14.3	—	2.40	12.6	—
Magnesium	0.14	0.17	—	0.23	0.30	—
Virgin copper	—	33.3	84.3	—	28.9	97.5
Virgin zinc	—	19.1	38.8	—	18.7	35.8
Refined lead	—	17.9	32.6	—	13.9	14.8
Tin	—	2.30	12.6	—	2.64	16.2
Zinc concentrates	—	13.5	70.0	—	13.5	86.0
Steel ingot and castings (including alloys)‡	293†	—	—	244	—	—
Rubber :						
Waste collected	0.01	0.21	11.1	0.04	1.55	81.4
Reclaimed	0.48	0.49	3.67	0.42	0.45	4.96
Natural	—	4.08	140.3	—	6.76	131.9
Synthetic	—	0.05	2.05	—	0.06	2.90

• Distilling only. † May. ‡ Weekly average.

FIRE PROTECTION IN LABORATORIES

Practical Views on Equipment and Design

METHODS of fire protection in scientific laboratories was one of the subjects which received close attention during the general discussion following the presentation of papers at the Royal Institute of Chemistry symposium on "Laboratory Layout and Construction" (THE CHEMICAL AGE, April 24). A summary has now been made of a number of very practical points raised by members.

When members urged that adequate fire services should be an important factor in laboratory layout, Dr. F. H. Milner, who had previously described the adaptation of a large house as a laboratory, gave his audience brief details of the fire control services installed in the building.

Fire Drill Essential

The house, Brockham Park, was served by a 2-in. fire main with hoses in glass-fronted boxes at strategic points. In addition, foam type extinguishers were placed in the corridors and methyl bromide type extinguishers fitted inside the laboratories. Each laboratory was also fitted with escape gear at the windows.

Another member, Mr. Wilson, commented on the need for providing ample fire extinguisher capacity, particularly under present-day conditions of overcrowding in laboratories. The carbon tetrachloride type of extinguisher, he observed, gave rise to unpleasant odours and the methyl bromide type produced toxic fumes; thus these two types of extinguisher were, in his opinion, unsuitable for laboratory use. Most insurance companies insisted on the provision of foam type extinguishers, but he did not consider these entirely satisfactory since they left a good deal of mess to be cleared up after the fire had been extinguished. His personal choice was the extinguisher using carbon dioxide gas.

Following Mr. Wilson's comments several speakers advocated regular fire drill in laboratories, and suggested that familiarity with the method of operating fire extinguishers should form part of the laboratory discipline.

Laboratory Design

Asked if there was a basement at Brockham Park, and what were his ideas on the best use of it, Dr. Milner said that the basement consisted of a number of cellars which were used as auxiliary stores. The boiler, compressed air and vacuum pumps were also housed in the basement.

This led another member, Mr. Hiall, to point out that the symposium had stressed the lack of architects acquainted with the needs of chemists. As a result, most chemists had to design their own laboratories, and since they were not necessarily experts in this field the results were not always satisfactory. He pleaded for more architects to specialise in laboratory design.

Replying to this point, Mr. Prior (author of a symposium paper on laboratory fittings and fixtures) pointed out that there are many types of laboratories, chemical, physical, medical, etc., and it would be impossible for any architect to be sufficiently versed in these sciences to be able to design satisfactory laboratories for them all. In his view it was better for the scientist to consult a specialist experienced in the fitting out of the particular laboratory required, and to consult with the architect to ensure that the design of the laboratory was satisfactory.

Artificial Quartz Crystals

Useful Result of G.P.O. Research

A NEW chemical process for the production of piezo-electric crystals which, in addition to its scientific value, may lead to a considerable saving in dollar expenditure, is being developed at the Post Office engineering research station at Dollis Hill.

It is hoped that quartz crystals, which are purchased mainly from South America and which have been used for many years for frequency control of radio transmissions, can be displaced by artificial piezo-electric crystals grown under laboratory conditions.

Used As Resonators

The modern technique for telephone transmission over long land-line routes is to concentrate a number of telephone conversations on a single pair of conductors, each conversation occupying a different point of the frequency spectrum, with separation controlled by quartz crystal resonators. Signal strength over long distances is maintained by using wide-band amplifiers every six miles, and thus equipped two co-axial cables can carry over 600 simultaneous conversations.

It is now hoped that the artificially grown piezo-electric crystals can be used in such multi-channel circuits for frequency control and separation.

NON-FERROUS METALS FEDERATION

President on Effects of State Control

BY the enlistment during the year of the Non-Electrical Copper Association, the number of metal trade firms within the British Non-Ferrous Metals Federation was raised to 74.

Announcing this at the annual general meeting of the federation in Birmingham last week, Mr. Horace W. Clarke, who was re-elected president for the third year, referred with deep regret to the loss the federation has recently sustained by the death of their first hon. treasurer, Mr. Lloyd Gibbins. They were fortunate in having secured the acceptance of Mr. A. L. Johnson, chairman of the High Conductivity Copper Association, to accept the vacant Office.

Dependent on the Government

Reviewing principal activities during the year, the chairman observed: "This industry is still dependent upon H.M. Government for its raw material and for its licences. It is, therefore, natural that relations with the Ministry of Supply should be one of the most important functions of the federation. The closest contact is maintained with the officials of the Ministry who are responsible for our destinies. Regular monthly meetings are held at which the problems of the industry are freely and frankly discussed in the fullest detail, and from which the industry derives a substantial advantage.

"It is true that we do not get everything we ask for, but within the limits imposed by the Government policy of bulk purchasing, I think it right to say that we do receive sympathetic consideration and help from the Ministry.

"One of the regular subjects of discussion at these monthly meetings during the past year has been the relation between the prices at which non-ferrous metals are sold to us by the Ministry of Supply, and the world price at which our foreign competitors can buy. We have not ceased to emphasise the disadvantage at which this places British industry, and in this I include not only ourselves, but also our customers whose products, incorporating non-ferrous metals, account for more than half of this country's export programme.

"Unfortunately, this is one of the subjects upon which we have received sympathy, but, so far, without action. We shall, however, continue to press this point, in the hope that the British price may be brought rapidly into relation with the world price.

"These meetings have also provided an opportunity to discuss the level of metal consumption. The federation views with some anxiety the continued shortage of high grade zinc, and is constantly pressing the Ministry of Supply on this point.

"The first object of the federation, stated in its constitution, is 'to serve the interests of the community by securing production of the maximum output at the lowest price consistent with the maintenance of quality and the provision of fair remuneration for labour and capital.' This is an effort to put into words the principle which has guided the industry for many years and which has always been embodied in the work of both the trade associations and of the federation.

"Free Men"

"We believe in private enterprise, but this does not mean the absence of discipline or disregard of the public interest. It means that we believe that in the long run the only satisfactory form of discipline is that which is voluntarily undertaken by free men.

"It used to be said that the system of private enterprise was on its trial. From some of the recent developments it seems to me that it would perhaps be truer to say to-day that it has been condemned without a trial.

"Under the recent Industrial Organisation and Development Act, the Government is experimenting with the establishment of so-called Development Councils, consisting of a mixture of individuals drawn from various categories, whose object appears to be to give instructions to those who are actually concerned with the industry as to how they should conduct themselves.

Need for Vigilance

"I hope that the day is far distant when anyone would desire to make such an experiment with our industry. We have always had complete liberty in the past and we feel that we have made the best use of that liberty and that our industry may well serve as a model, but in the words of Edmund Burke 'the price of liberty is eternal vigilance.' We must be vigilant to conduct our affairs with the greatest possible efficiency and the minimum waste of time, material, and manpower. Our house is at present in order; it is up to us to keep it so."

Earlier, the chairman mentioned that,

(*Continued overleaf*)

Reopening the Metal Exchange

Users' Scheme Submitted to the MoS

REPRESENTATIVES of producing and consuming interests in the non-ferrous metals industry attended a meeting of the London Metal Exchange last week to hear details of a scheme for the re-opening of the metal market.

The chairman pointed out that the chief reasons for not re-opening the market, as put forward by the Ministry of Supply, were currency difficulties and scarcity of supplies. The exchange committee was confident that, apart from the safeguards it proposed to apply, any irresponsible attempt to influence the price structure could effectively be dealt with by the revisions which have been made in the rules and regulations of the exchange.

"Flexible" Licensing

The market which the exchange contemplated would in the transition stage not be a "free market" in the same sense as the term was understood before the war. It was proposed (a) that it should function as regards tin within the framework of the allocation scheme, so that no country could acquire an extravagant supply to the detriment of any other; and (b) as regards other metals under a system of United Kingdom domestic licensing and export permits as at present in force.

So as to meet changes in the situation which an open market would undoubtedly disclose, the metal exchange would like to see a little more flexibility introduced into the manner in which international tin allocations were made and also in the way in which licensing procedure for other metals was carried on. An open market, even within the limitations suggested, would give a more accurate picture of actual conditions governing supply and demand and a price more truly representative of world values.

The committee has submitted details of the plan to the Minister of Supply and discussions are expected to begin shortly.

NON-FERROUS METALS FEDERATION

(*Continued from page 77*)

"When the federation was newly formed in 1945, one of our earliest activities was the collection and publication of statistics. This branch of our activities has developed very considerably during the past three years, and the federation statistics department has now been called upon to undertake a larger and even more important responsibility. The federation, in conjunction with the British Overseas Mining Association and the British Non-Ferrous Smelters' Association has established the British Bureau of Non-Ferrous Metal Statistics with the object of collecting and publishing comprehensive statistics of production, consumption and stocks of non-ferrous metals in the United Kingdom and throughout the British Empire.

"This venture has the whole-hearted support of the Ministry of Supply and of the principal producers and consumers in this country and all the Dominions and Colonies. This new development is, in my view, of the utmost significance and we are looking forward to receiving the first number of the bulletin in the course of the next few weeks."

The elections, in addition to that of the president, conferred office on the following: Vice-presidents: Mr. W. J. Terry, Mr. W. H. Henman, Mr. H. E. Jackson; treasurer, Mr. A. L. Johnson; chairman of the executive committee: Mr. Horace W. Clarke.

Ceramic Congress

A group of Netherlands ceramic industrialists and technicians, with the co-operation of the British Ceramic Society is organising an International Ceramic Congress which is to open in Maastricht, Holland, on September 12. Support has been promised from the ceramic industries of Italy, Denmark, Norway, Sweden, France, Belgium and Switzerland. Arrangements in this country are in the hands of the hon. general secretary, British Ceramic Society, The Mellor Laboratories, Hanley, S.O.T.

Education Abroad. — British students requiring information about the educational facilities and opportunities for specialised study available abroad are invited to contact I.B.A., International Correspondence Service, Karlsruhe-Durlach, Pfinzstrasse. 69, U.S.-Zone Germany.

ACTIVATED CARBON FROM COAL

Conversion and Testing Processes

From a Special Correspondent

COAL is still relatively a cheap material when it is considered that from it can be made, by simple processes, activated carbon worth from £30 to £60 a ton. Within the past few decades activated carbon has been developed throughout the civilised world for use in decolorising processes, gas and vapour adsorption, the purification of water and other materials.

To a great extent it has replaced the time-honoured charcoal in such techniques and it owes its efficiency to the fact that it has a much greater adsorption capacity—due to its large surface area—weight for weight, than is obtainable with charcoal.

This greater efficiency has several advantages, for example, to achieve a specific result the quantity of activated carbon is much smaller than the charcoal needed. Both charcoal and activated carbon retain within themselves a portion of the material they are treating; so that the small amount of activated carbon used reduces losses by this cause.

Due to the much greater activity of activated carbon, it is possible to employ it in processes for which ordinary charcoal is entirely unsuitable. One example of this is the recovery of gases and vapours. In the modern industrial world there is, accordingly, a wide sphere of usefulness for activated carbon.

During the first World War, activated carbon was tried out in gas masks and was found very effective for the adsorption of certain poison gases. In the subsequent post-war years British manufacturers started production of activated carbon for gas and vapour adsorption and for decolorising purposes.

Raw Material

In spite of this British activity, until quite recently a big proportion of activated carbon used here has been imported. On the Continent of Europe its manufacture has been carried on to a much greater extent than here, and a study of patent literature shows that Germany and contiguous countries have prosecuted their researches in this sphere more vigorously than we have.

Generally speaking, many different carbon-containing materials may be used as raw material for activated carbon production. Wood, waste vegetable matter, grass, nut shells, etc., are all potential raw material for this purpose. If, for example, all the canning factories packed peas all the year round and sent the hulls to a common centre that waste would provide all the raw material required in this country.

The farmer cannot spare his hay for carbon making, while neither wood nor nut shells exist here in abundance The one raw material that we have here, all the year round, is coal. For this reason—which also applies to a less extent to European countries—coal is the one convenient raw material that can be used. If we enlarged our activities in this sphere, instead of importing carbon at around £40 a ton and exporting coal at around £2 a ton, we should soon be exporting carbon at the higher figure.

It is well known that all coal contains a high proportion of carbon; the higher this is for activated carbon production the better. The coal also should preferably be low in volatile content, sulphur and ash. These requirements obviously indicate anthracite as the most appropriate raw material.

Homogeneous Mixture

When coal with a high volatile content is used, it is generally most economic to use the coke instead of the coal itself. Neither lignite nor bituminous coal, used alone, produces a good quality activated carbon; the ideal mixture consists of anthracite with 30 to 40 per cent other coal, which avoids undue caking.

If, say, 100 tons of coal were converted, the resultant activated carbon would vary widely in its properties at different parts of the batch. This is because the raw material is not homogeneous. To secure uniform composition, the coal has to be crushed to small nuts, about 1 in. cross section, and mixed. Crushing is done in jaw crushers of suitable size and mixing may be carried out on a reciprocating metal screen which will eliminate the dust and slack at the same time.

The next step is to coat the screened nuts with a carbohydrate material, in such strength that the dried coating forms about 0.5 per cent by weight of the coal. Material in use for this purpose includes starch, glucose and molasses solutions. These may be applied to the nuts through the usual type of coal-washing plant, or by the use of a shaking screen, the solution being sprayed on the nuts from overhead. The latter method enables the surplus solution to be trapped and re-used.

Carbonising retorts and activating retorts generally stand on the same site, so that the

gas from the former can be used in heating the latter; and in most gases one or more gas holders are used as a reserve supply. Iron retorts are normally used for carbonisation and the process is carried out in two stages, the temperature not being high enough to crack the gases coming off. Cracking would result in the deposition of carbon on the surface of the material, and this carbon black could not be activated.

A temperature is therefore maintained just high enough to eliminate the bulk of

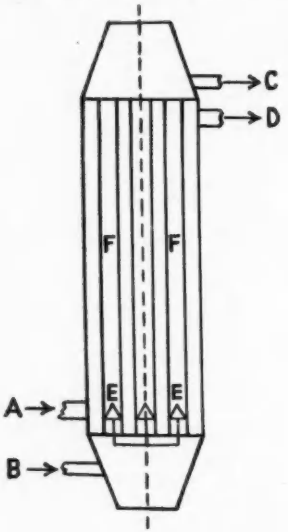


Fig. 1

the volatile matter, and is usually between 470° and 480°C. This temperature is held for two hours, after which it is slowly increased, so that at the end of the third hour 750°C. has been reached. This temperature is held for about three hours.

The importance of using raw material of low volatile content is, of course, fundamental. A large proportion of volatiles cannot be adequately expelled without elevating the temperature to a range at which some of the gas invariably cracks and deposits inert carbon on the material, so preventing its thorough activation at a later stage. High volatiles also mean big carbonising losses in terms of weight lost in raw material.

At the end of the heating cycle the material is allowed to cool, removed from the retorts, and ground to a fine powder between steel crushing rolls. It is then put through wire screens of about 150 mesh, the rejected portion passing again through the rolls. The powder has now a silky feel to the touch and is practically black in colour, due to the incorporation of the carbohydrate matter; but it does not yet possess any activity.

Activation

The most common activating medium is steam, and to a less extent gasses, such as water gas, producer gas, or hydrogen. A typical German retort for the activation process (covered by German patent 336,797) is shown in outline in Fig. 1. The retort is of the vertical pattern and within the steel shell are fixed a number of tubes F. These tubes contain the powdered material to be activated, so that the latter is exposed over a wide area to the hot gases surrounding the tubes and heat penetration to the centre of each tube is very rapid.

The hot gases enter at A and leave at D; while the steam goes through B and drives out gases at C; the retort being charged through a manhole at the top and discharged through the bottom. Entrance and exit are covered by hinged, gas-tight manhole steel plates.

Near the bottom of each tube is a steel cone E, perforated throughout its surface to allow the reaction steam to pass up the tube. These cones serve to spread the steam in a uniform stream through the contents of the tube, and also to support the charge in each tube. Any individual cone may be lowered irrespective of the others, so that a sample can be withdrawn from a particular tube and, if necessary, longer treatment be given to individual tubes.

The powder in the tubes is initially merely an absorbing mixture of amorphous carbon and hydrocarbons. As steam passes through the powder, at a temperature of about 910°C., oxidation occurs and the hydrocarbons are eliminated, followed by the much slower oxidation of the amorphous carbon.

A little more than half the gas coming from the retort after passing through the powder is hydrogen, when steam is the activating medium, the remainder being a mixture of CO and CO_2. This gas mixture, not unlike water gas in composition, is also stored for heating the retorts. The period required for the activation process is generally of the order of 4 to 5 hours; the exact length of treatment being governed by the operating temperature, quality of raw material, and amount and pressure of steam passing into the retort.

Testing

Even the expert cannot judge the quality of activated carbon by looking at it or touching it, for its appearance is no

criterion of its efficiency. A certain amount of routine testing of each batch is necessary. Such routine tests include estimation of moisture, which is nil when the material leaves the retort, but rapidly rises to around 7 or 9 per cent when the product has stood for some hours exposed to the surrounding atmosphere.

Another examination is the screen test, which is accomplished by passing the carbon through wire sieves of different mesh and noting the proportion of each particle size. The proportion of water-soluble matter is usually ascertained, and also the *p*H value of distilled water that has been boiled with the carbon; such value being returned as the *p*H value of the carbon.

Oil Retention

Perhaps the most important test is, however, the determination of the amount of oil which the carbon will retain when brought into contact with oil. Such information is of vital importance to oil refineries which use the activated carbon for decolorising and purification purposes. For the value of the carbon is governed not only by its activity but also by the proportion of oil it will retain, for oil so retained represents a loss to the refiner.

There are two distinct tests for measuring the behaviour of the carbon when in contact with oil. These are the oil saturation value (OSV) and oil retention value (ORV). The OSV of a carbon is a function of the apparent density, while the latter is governed by the particle size of the carbon; so that for a specific particle size of carbon there is an approximate figure for its OSV. These particular tests have been well developed in the U.S.A., by the Darco Corporation, and are being adopted in this country.

The apparent density of a carbon is determined by measuring the volume occupied by a known weight of carbon when packed so that it will not decrease in volume by continued tamping, or by measuring the amount of carbon which may be packed in a container of known volume. To do this, one determines the approximate weight of dry carbon necessary to fill a 100 c.c. graduated glass cylinder to the top graduation. This quantity of carbon is then weighed out and transferred to a cylinder. The latter is then closed with a stopper to avoid loss of carbon and the cylinder tapped gently on a table until no further settling of carbon occurs. The volume occupied by the carbon is then read off, and the apparent density is equal to the grams of dry carbon taken, divided by the volume, in c.c., occuped by the packed carbon.

The OSV of a carbon is expressed as the grams of oil required to wet 100 grams of carbon; the test being carried out as follows. A small weighed sample of carbon, 5 to 10 grams, is placed in a 250 c.c. porcelain casserole the clear oil is then added slowly, drop by drop. After each addition the carbon is stirred gently, care being taken to see that all traces of oil have disappeared before adding more oil. The carbon mass will ball, either forming one or a few large lumps; the end point being reached when the casserole shows the first trace of streakiness. This becomes quickly apparent, for previous to the addition of the last few drops, the surface of the casserole becomes perfectly clean and bright. The oil saturation value is expressed as grams of oil per 100 grams of dry carbon. If the oil has been added from a burette the volume is known, and knowing the specific gravity of the oil, the OSV is readily calculated.

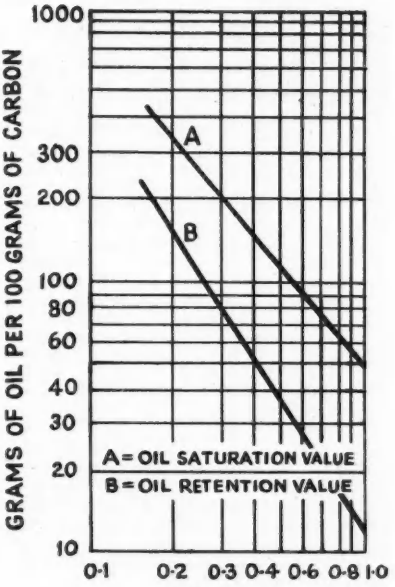


Fig. 2

The oil retention value is a measure of the oil held in the cake of a filter press after blowing the press, and it is expressed as grams of oil per 100 grams of carbon; the test being carried out as follows. One hundred grams of dry carbon are mixed with four litres of oil and heated to 50-55°C. This mixture is then filtered through a laboratory plate and frame press which has been pre-heated by blowing steam

(*Continued overleaf*)

Oils and Fats in S.E. Asia

Large Production Plans Formulated in India and Ceylon

ARTICLES available in Japan as war reparations to Ceylon include plant for the production of caustic soda. This is capable of stimulating the soap, textile, and paper industries. By-products of the electrolytic process, such as bleaching powder, chlorine and hydrochlorine acid will also be useful.

* * *

In his presidential address to the first South Indian Soap Makers' Conference held in Calicut, Rao Sahib A. K. Menon said that the price of soap was bound to increase unless supplies of coconut oil were augmented by imports from Ceylon and the Philippines. He also suggested operating a factory exclusively for vegetable tallow. There were several kinds of indigenous vegetable fats such as dupa fat, kootum fat, etc., the production of which could be stimulated by organised effort. Several essential oil bearing trees, herbs, etc., would also yield appreciable quantities of oil. Systematic planting should be organised on a commercial scale. Regional experimental stations should be established and suitable plants selected for cultivation. Such stations might be set up in the Nilgiris for eucalyptus, geranium and gultheria, in Cochin or Travancore for lemon grass and picholi, in Mysore for sandalwood, in Malabar citrus oils, cinnamon and ginger oils, and in the Central Provinces for palmarose and citrus oils.

* * *

Mr. Menon also recommended the Central and the Provincial Governments to regulate the export of sandalwood oil. It was necessary that the manufacture of synthetic products should be attempted on a large scale so that India could become independent of foreign supplies He advocated making strong representations to the Government of India to give effect to these proposals.

* * *

Recent developments in the establishment of a synthetic petrol industry in India include the possibility of the erection of a factory, jointly owned by the Indian Government and an American oil company, and a scheme for introducing the underground gasification method where coal deposits prove uneconomic for surface processing.

Reports from Indian commercial circles suggest that the new factory will be erected in Bihar and that the Government, contributing 51 per cent of the total capital, will control policy, while the U.S. concern will provide the remainder of the capital and the necessary technicians to supervise the working of the plant.

The Government has received a recommendation from the Fuel Research Committee that a statutory levy of ½ anna per ton of coal despatched in India should be imposed to aid fuel research.

ACTIVATED CARBON FROM COAL

(*Continued from page* 81)

through it for 10 minutes before filtering. The oil-carbon mixture is then put through the press under a pressure of from 30-40 lb. per sq. in. After filtering, the press cake is treated as follows, while still in the press. The cake is first blown with air for 15 minutes at 40 lb. pressure, it is then blown with steam for 15 minutes at 30 lb. pressure, and finally with air for 10 minutes at 40 lb. pressure. The cake is then removed from the press, mixed thoroughly and a sample taken, from which the amount of oil still retained can be found by solvent extraction.

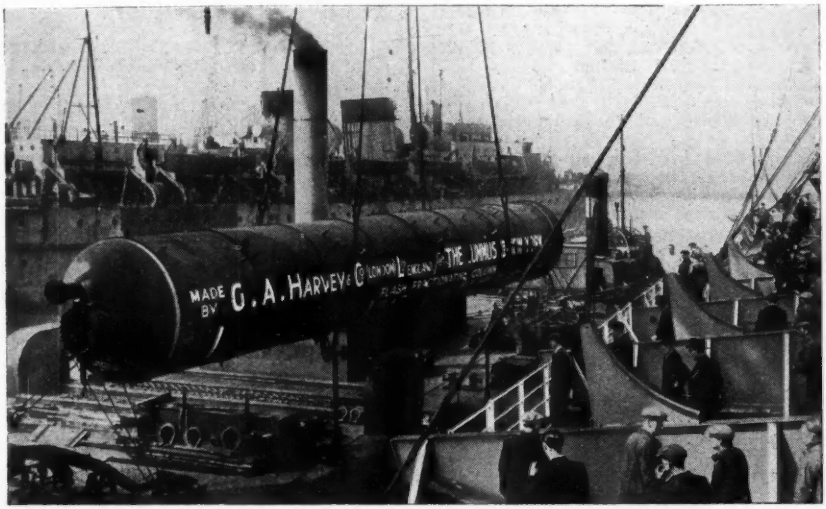
The following table gives the apparent density, the OSV and the ORV of various grades of carbons.

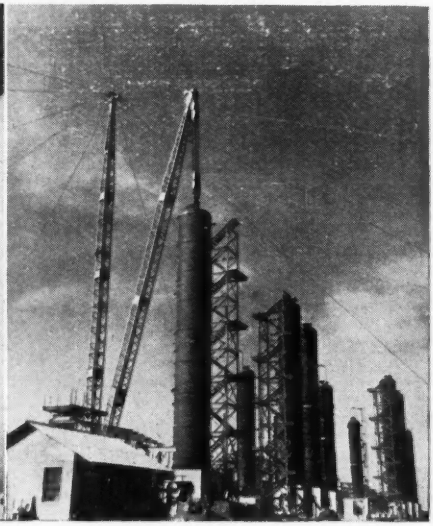
Carbon Number	Apparent Density grams per c.c.	Grams of oil per 100 grams Carbon OSV.	ORV.
1	0.245	258.0	105.0
2	0.252	249.0	98.4
3	0.270	220.0	105.0
4	0.275	222.0	93.0
5	0.288	183.0	72.4
6	0.292	185.0	71.4
7	0.295	204.0	75.2
8	0.310	179.0	70.3
9	0.320	175.0	68.3
10	0.390	148.0	39.0
11	0.485	125.0	36.1
12	0.515	118.0	33.0
13	0.540	110.0	29.0

If the logarithm of the OSV be plotted against the logarithm of the apparent density, it will be found that the points fall nearly on a straight line. Likewise, a logarithmic plot of the ORV against the apparent density gives a straight line. Both these lines are seen in Fig. 2 (*previous page*), and from an inspection of these it is seen that a carbon of high apparent density will retain a much smaller quantity of oil in the press cake than will one with a low apparent density.

Unlicensed Construction.—I.C.I. (Explosives), Ltd., was fined £100 and ordered to pay £11 4s. 4d. costs for constructing a road at the Tuckingmill factory, near Camborne, Cornwall, without a licence. A fine of £25 was also imposed on Mr. G. Davies, deputy works manager.

An Engineering Odyssey





These pictures represent the culminating stages in an engineering odyssey, of which we illustrated the beginning in London ("The Chemical Age," April 17). They record how the 83 ft. fractionating column for Shell Petroleum's new refinery at Cardón, Venezuela, was loaded aboard at Royal Albert Dock, cast overboard at Punta Cardón to be floated ashore, and finally added its imposing bulk to the refinery skyline *[Courtesy of "The Shell Magazine."*

GERMAN WOOD CHEMISTRY

Wartime Production of Food and Chemicals

THE BIOS Final Report No. 3, just issued by H.M. Stationery Office (6d.), summarises with extreme brevity some 40 or more FIAT and BIOS reports on the German timber and allied industries. It is nearly unique in that as many pages are occupied by index and references as by actual text, but the index has, of course, to represent all the original reports.

The first five summaries deal with composite wood manufacture, wood bending, pencil manufacture, wood structural research, machinery and equipment. Of more interest, but unfortunately very brief, are the remaining three, the chemical section, relating to preservatives substituting creosote, restricted use of creosote, and chemistry of wood and its products.

Until 1940, creosote accounted for 90 per cent of German wood preservative needs; then it was replaced by waterborne products—Flunax, Basilit, Wolman salts, and zinc chloride. Details are given in FIAT final report (No. 480), in which the view is expressed that, in this field, German technique was 30 years behind American. What little creosote was allowed for timber preservation was probably used for marine timber (FIAT, final, No. 478).

In the production of sugars, alcohols, and yeasts, as is known, two processes had been used to effect hydrolysis of wood to reducing sugars: (1) the Bergius, using cold concentrated HCl (BIOS Nos. 7, 176, and 202); (2) Schöller, using dilute H_2SO_4 under pressure (BIOS Nos. 176 and 202). The latter is considered the more efficient and economical.

The neutralised solution of sugars from soft or gymnospermic woods by either of these methods is for the most part fermentable by baker's yeast to give ethyl alcohol. After addition of suitable nutrients the sugar solution can also be used to support growth of good yeast (*Torula utilis*, etc.).

Only about 66 per cent of the sugar from hardwoods (angiosperms) is fermentable by baker's yeast, but food yeast can utilise all the sugars from this source, and large quantities were used as food during the war. Extracts from autolysed food yeast were said to have a high B group vitamin content (CIOS XXIX-5 and BIOS, final, No. 5).

In the sphere of wood distillation, no research was done on carbonisation, and charcoal needs were supplied mainly from the 11 plants of Degussa (Deutsche Gold, etc.) using the Reichert process, in which the retorts are heated by recycled hot gases given off in distillation; this secured relatively accurate temperature control in the 100 cu. m. retorts.

The original reports describe the refining, etc., of these volatile products. Melakol, a plasticiser for reclaimed rubber, is prepared from the wood tars. Other products are flotation oils and four types of inhibitor, activated carbon, etc. Beech wood is used almost exclusively for wood distillation (FIAT, final, 444 and BIOS, final, No. 128).

Vanillin has not yet been produced from sulphite liquor on a commercial scale, but details are given of a method proposed by strong alkaline cleavage of sodium lignosulphonate in copper vessels. It is claimed that the copper of the vessel has a catalytic effect on the cleavage reaction, which produces high yields of vanillin with low consumption of alkali (FIAT No. 448). Tanning agents were prepared from spruce sulphite waste liquor freed from sugars by previous fermentation with yeast. The artificial tanning liquors have been used to good advantage to supplement and improve blendings of the rather scarce natural tannins (BIOS, final, No. 157).

Only two alternatives for wood and cotton as sources of cellulose were used: (1) cereal straw prehydrolysed to remove pentosans and pulped by the sulphite process; (2) *Arundo donax*, a reed prevalent in N. Italy and readily pulped by the bisulphite method. Laboratory tests were also made with rape fibre, esparto, and sorghum bagasse. Potato haulms were found unsuitable (FIAT, final, No. 450 and 490).

Although it is said that cellulose research was not particularly fruitful, some interesting information was obtained from Dr. Schöller (interviews in No. 450) on important advances in wood sugar fermentation to yield alcohol and/or food yeast. At the Bergius Research Laboratory, also, details were obtained of a process for continuous hydrolysis of wood with concentrated HCl.

In BIOS, final, No. 135 a short account is given of the work of Dr. Runkel on some 80 species of tropical woods as possible sources of cellulose. It is thought that these could be treated to yield paper and rayon pulps either by the sulphate process or that of Runkel, involving: (a) digestion of chips under atmospheric pressure with 3-5 per cent aqueous NaOH at 100°C.; (b) defibration in a rod mill; and (c) further delignification and bleaching by sodium chlorite in the presence of acetic acid (*see also* BIOS, final, No. 18).

FRENCH HYDROGENATION AND FRACTIONATION

Varied Yields of Low Temperature Processes

THE first description in some detail of certain aspects of recent research in France on the manufacture of fuel oil by hydrogenation has now been made generally available. This work was undertaken with the support of the French Government to provide a comparative study of the existing processes.

This review (*Chim. et Ind.*, 1948, *59*, 548-551) is a paper by Louis Thibaut, director of the Cie Française des Essences Synthetiques, which was originally presented at the XX Congress of Industrial Chemistry in Paris.

Works were constructed at Liévin for trying out the process of the Soc. Nat. des Recherches by the C.F.E.S.. The latter company, also, after much preliminary research, evolved a method which was first tested about 1938. It consisted essentially in a progressive hydrogenation with simultaneous fractionation of products, the lighter fractions being withdrawn while the heavier are subjected to complete digestion. A new catalyst is also used.

Economies

Considerable simplification of plant and reduced cost of operation are claimed. Applications were made for patents in France and the U.S.A. (French application Nos. 450,376 of 17/8/39; U.S.A., 3/2/45; 478,267 of 16/4/43; and 472,220 of 5/10/42).

Subsequently the heavier fractions from coal, especially tar oils distilling above 300°C. and the like, were hydrogenated by the new process, whereby many new products, including lubricants, were obtained.

The hydrogenation is effected at a gradually increasing temperature, from 300°C. up to 500°C., in such manner that the action of the hydrogen is more and more effective or intensified. To prevent destruction at a higher temperature of products formed at a lower, these are withdrawn into a zone cooler than that in which they were formed. The various products are thus hydrogenated at the lowest possible temperature and removed as formed.

A single autoclave is used, divided into compartments providing for ascent of gas and descent of liquid, after the manner of a still; and providing also for introduction of suitable catalysts at the proper stages.

The material to be treated, finely powdered and forming a paste with oil from a previous operation, is introduced into the upper part of the autoclave under pressure of 250-500 kg/cm² and at a temperature below 100°C. The hydrogen, also under suitable compression and at 450-500°C., is introduced at the bottom, carrying the lighter products with it in its upward progress.

Special Features

In this way there is established a gradually increasing temperature in the autoclave from about 300°C. near the top to 500°C. below. Certain products are removed by the means described and illustrated, and the hydrogen current and mixture of medium oils passes into an auxiliary autoclave containing a fixed catalyst for conversion of these oils into spirit.

The catalyst, hereafter described, is very active and not greatly affected by the hydrogen/oil ratio. Conversion into spirit is total in one passage, except for a certain amount of medium oil left unchanged for use with the next charge.

Among the special features to which attention is directed are: (1) Simplified working and more efficient hydrogenation; (2) the medium oils, being obtained at the minimum temperature, are richer in products which greater heat destroys, such as the lighter phenols; (3) the upper part of the autoclave has to be cooled to ensure the requisite scaling down of temperature, so that the raw material in paste form can be introduced at about 80°C., thus making unnecessary its pre-heating — usually a costly and difficult operation (4) the medium oil may be directly converted into spirit without a lot of supplementary treatments; (5) residues withdrawn at the bottom where hydrogenation is carried to an advanced stage are for the most part free of any material suitable for further treatment.

Here, again, troublesome separations or the like and the apparatus required for such processes may be dispensed with. From trials made with a pilot plant (20 tons daily) with combustible material from the Bouche-du-Rhone and Landais coalfields it was found that the saving on total power required and on labour, compared with the "classic" processes, was about 40 per cent.

Attempts to find a cheaper and more efficient catalyst than the usual molybdenum or tungsten type on porous supports led to iron sulphide plus some cyanide or

sulphocyanide of iron, chromium, or aluminium. The new catalyst thus consists of iron sulphide supported on active carbon and activated by small amounts (up to 3 per cent of sulphide) of cyanide and sulphocyanide of the metals named.

The new catalyst is prepared by the wet method in ammoniacal medium, and care must be taken to eliminate from the final product all traces of ammoniacal salts. Hydrogenation is said to have been carried to 95 per cent in one cycle. At the temperatures used formation of gaseous hydrocarbons is less than usual, and octane number is raised to 77.

In attempting at first to hydrogenate the heavy fractions of anthracene oils, coming over above 300°C., it was found that, with a finely divided orthodox catalyst method, these fractions were not transformed even at 450-460°C.; but at 380°C. with the new catalyst profound changes occurred.

The crude product had a density of 1.040 as compared with 1.160 for anthracene oil. It was clear and fluorescent, stable at high temperature, with no appreciable content of asphalts or heavy constituents insoluble in petrol or benzene, and no anthracene smell.

Efficiency was up to 90 per cent hydrogenation, and hydrogen consumption per ton of heavy oil treated was 1000 cu. m. Yields were 45 per cent medium oil for conversion into spirit; 25 per cent oil of viscosity 1.7 Engler at 50°C., suitable for transformer or lubricating oil; and 30 per cent oil of viscosity 4.

The heavier oils (red oils) from tar distillation *in vac.* could be similarly treated, with 92 per cent yield and hydrogen consumption of 1000 cu. m., 20 per cent of the product being suitable for conversion into spirit, 20 per cent for transformers or refrigerators, and 60 per cent very viscous (25 Engler), for lubricants and other mixtures.

WORLD RUBBER ESTIMATES

NEW estimates of world rubber production made last week by the chief of the U.S. Department of Commerce's rubber division, Mr. Earl W. Glenn, foresaw increases in production totals and use of rubber in the U.S.A. in 1948. Total world supply of new rubber material this year, according to this estimate, is expected to be about 2 million long tons, natural rubber accounting for 1.45 million to 1.5 million tons of the total. Synthetic rubber produced in the U.S.A. and Canada would account for the remainder.

Foreign demand for natural and synthetic rubber is expected to total about 825,000 tons.

New Canadian Industries

Industrial and Scientific Progress Report

BY the formation of Northern Chemicals, Ltd., with the aid of U.S. capital, Canada will become a major contributor to the lithium industry. The Lithium Corporation of America has a substantial interest in Northern Chemicals, which is now developing what is believed to be the largest single world deposit of ore in the Cat Lake area of Manitoba. The high chemical activity of lithium makes it and its alloys very effective refining agents for degassing and purifying copper, bronze, aluminium, magnesium and steel. Lithium salts and compounds are also incorporated into porcelain enamels, glazes and ceramic bodies and produce greater fluidity and retention of lustre and colour.

A cellulose sponge plant requiring an investment of more than $600,000 is to be opened at Shawinigan Falls, Quebec, by Canadian Industries, Ltd. The plant will be adjacent to C.I.L.'s present Cellophane works and will begin operation by middle of 1949. Cellulose sponges, which have never before been made in Canada are closely related to rayon and Cellophane and are made by processing wood pulp, caustic soda, hemp, salts and other materials. They are said to have all the essential properties of natural sponges, are more durable and can be cut to any required size or shape.

Radio Active Materials

Radio active materials derived from the atomic energy plant at Chalk River, Ontario, have "countless uses" in medical and industrial research, records the National Research Council of Canada in its 31st annual report, reviewing the several branches of science and technology to which particular study has been given. The president, Dr. C. J. Mackenzie, reported that 1000 skilled workers, half of them scientists "and many having world reputations in nuclear physics, were concentrating on producing radioactive materials and on revealing fundamental knowledge." Practical results had already been achieved in human, plant and animal physiology by application of the products of the two radioactive piles. A 5 million volt generator was under construction. Fundamental research had been started on the nature and source of cosmic rays, colorimetry and photometry had been expanded satisfactorily, and laundry and dry cleaning, protective treatments for stone and atmospheric pollution were among the industrial subjects now undergoing research.

WORK ON ARSENIC INSECTICIDES

The Quest for Non-Toxic Preparations

DESPITE the introduction in recent years of many new insecticides and fungicides, arsenic in some form or other still remains the basis of many of the most effective preparations. A valuable review of the extensive literature which has accumulated in this field is given in the *Zt. f. Pflanzenkr. u. Pflanzenschutz*, 1948, 55, 35-53, by Walther Trappmann, containing nearly 200 references.

Under present world conditions affecting agricultural production and in view of the increasing seriousness of pest attacks, this matter of effective plant protection deserves to take priority in fundamental science and practical research.

The most important of the arsenic materials used for plant protection are in the form of either spray or dusting mixtures. Since the water-soluble arsenic compounds are injurious to plants, the main raw materials are the insoluble compounds, such as copper aceto-arsenite (Schweinfurth green), lead arsenate, and calcium arsenate, with appropriate admixtures. To a smaller degree, other metal arsenates as well as arsenic sulphide and London Purple (arsenate and arsenite of lime) are used or tried experimentally.

Minimising Toxicity

The chief advantages of arsenic preparations are their chemical stability, with which of course are associated durable efficiency, wide range of application, economy and relative ease of manufacture, and the possibility of combined use with other pesticides. On the other hand they have the serious disadvantage of toxicity to plants, animals, and human beings. By careful manufacture, however, and keeping water-soluble compounds and impurities down to prescribed limits or adding slaked lime to convert any soluble into insoluble compounds, risk of injury can be minimised.

The addition of various colloidal materials is also helpful, *e.g.*, iron oxide, calcium caseinate, glue, gelatine, molasses, etc., also animal, vegetable, or mineral oils and emulsifying agents. Differences between the primary, secondary, and tertiary arsenates in solubility and hydrolysis, for example, must also be taken into account.

In Germany, in the case of lead arsenate, the basicity of this, as determined by the Biologische Reichsanstalt, is given by the quotient $As_2O_5/PbO = 0.481 - 0.447$, corresponding to 60-80 per cent di-arsenate and 20-40 per cent tri-arsenate.

Hydrolysis will depend to a large extent on fineness of material. If too fine, up to the colloidal stage, there is greater risk of injury to plants, but attempts to reduce this risk by vigorous stirring in preparing calcium arsenate, or by heating this arsenate for three hours above 100° C. may make the product safer, although less efficient.

For use in fruit culture, especially against the codling moth and its larvae (*Cydia pomonella* L.) arsenic preparations are the most effective, although earlier experience in the U.S. suggested that the continued use of these insecticides might produce a more or less immune type of *Cydia*. This difficulty has been overcome by adding various materials, including fish—or mineral oils with a suitable emulsifier—to the arsenic compound to improve its adhesive and weather-resistant properties.

Fruit Tainted

Typical examples of this type of insecticide are the American sprays consisting of lead or calcium arsenate, zinc sulphate, oleic acid, petroleum, triethanolamine or ammonium oleate. The increased adhesion attained by these preparations, however, necessitated the introduction of stringent washing regulations in fruit-exporting countries because of the amount of insecticide covering the fruit when gathered. Since 1932 efforts have been made, particularly by the U.S. Bureau of Entomology, to find a suitable arsenic substitute.

A similar type of arsenic preparation has been used in Germany in the vineyards, but was usually only permitted as a protection against the first breed of larvae. Arsenic taint and poisoning risk in fruit reached a rather alarming stage at one period, and two German firms, the I.G. and Merck, introduced preparations for neutralising this effect. These, however, did not prove very effective, and again attempts were made to find arsenic substitutes.

Fluorine Compounds

As a result, fluorine compounds were adopted in the U.S.A. for a time, but in Germany the Biolog. Reichanstalt declared them to be unsatisfactory for fruit crops in that country. Another inorganic substitute, cadmium oxide or hydroxide, suggested by Ginsburg, also proved ineffective and other methods of pest control, including improved mechanical trapping devices, spraying apparatus and the use of various materials such as dinitro-o-cresol, oil plus

nicotine mixtures, etc., were all introduced with varied success.

Natural substances such as nicotine, pyrethrum, derris, are, of course, well known, and a wide variety of mixtures with these and other materials is described in the literature, including numerous stabilisers, activators, and other additives or improvers. Few of these were really effective arsenic substitutes, but a certain degree of success was achieved in Germany with quassia chip infusions for spraying (*Forestit-Merck*).

Review of Data

A large number of synthetic organic preparations have been tested, the literature of which is briefly reviewed by Trappmann. These include many thousands of compounds and more than a thousand literature and patent references, of which only a few are mentioned here. Details are given in the *Jnl. Econ. Ent.* (U.S.) 1936, *29*, 417-420; 856-9; 532-7; 1027; 467, etc. Phenothiazine possibly deserves special mention (*Better Fruit, Portland*, 1937, *31*). Guy investigated nearly 100 organic compounds in 1937 (*Bull. Del. Agric. Exp. Stat.* No. 206, Newark).

In Germany the greatest success appears to have been achieved with the gamma isomer of hexachlorcyclohexane (Gammexäne, etc.) known under various trade names—Nexit, Nexan, Viton; also the Bayer E 605, introduced in 1946 as Bladan-Neu, is the subject of high claims. This has great stability, is innocuous to human beings and plants, may be used in conjunction with fungicides and is easily and cheaply prepared. It is said to be not only a complete arsenic substitute, but far superior to any other known insecticidal contact or ingestion poison.

Another German material is Nirosan (Stillwaag: on arsenic substitute, *Angew. Bot.* 1939; *52*, 210).

Belgian Economic Survey.—The third in the series of Overseas Economic Surveys, "Economic and Financial Conditions in Belgium," with an annex on the Grand Duchy of Luxemburg, was published on Monday by H.M.S.O. (1s. 3d. net).

Trade with Turkey : More Scope for Pharmaceuticals

A FURTHER expansion of the Turkish market for British pharmaceutical supplies, at the expense of Switzerland and the U.S.A., is expected to result from Turkey's current shortage of dollars and Swiss francs.

Despite the priority allotted pharmaceutical imports by the Turkish finance authorities supplies, other than from the sterling area, are difficult and irregular compelling importers to concentrate more than ever upon establishing British contacts.

Outlining the prospects for British pharmaceutical firms entering the Turkish market for the first time, the journal of the British Chamber of Commerce of Turkey points out that imports are subject to special regulations imposed by the Turkish authorities.

Conditions of Entry

No pharmaceutical product may be imported into or sold in the country until a licence has been obtained from the Turkish Ministry of Hygiene. Once this has been granted, however, imports of that particular product are usually authorised without delay and exchange facilities granted. Any number of consignments can be imported against a health licence, but separate licences are required for each different product.

About four to six months elapses between the date of application and the issue of a licence and manufacturers are advised to send representatives to visit the Ministry personally so that any licence query can be answered promptly.

Each application for a licence involves the payment of about £10 in registration and analyst's fees, etc., and the licence is granted in the name of the agent-distributor who is held responsible for the quality of the imports.

Before granting licences the Ministry of Hygiene usually takes into consideration whether or not similar or substitute preparations are already being produced locally or if sufficient supply is already assured by previously issued permits. The price of competitive products is also taken into account.

Favourable Sterling Balance

An indication of the upward trend of British manufacture in the Turkish market is contained in a recent statement by a Turkish Government official in which he pointed out that Turkey's sterling balance amounted to £11 million. Last year at this time the balance was £16 million, a reduction of nearly one-third due to increased trade and insufficient reciprocal exports from Turkey.

NITROGEN, SULPHUR AND PEROXIDE

Fuller Documentation and Research in the U.S.A.

A NEW and comprehensive survey of the properties of sulphur, an appeal for U.S. Government support for research on nitrogen chemicals and a discussion of the problems involved in the handling of highly concentrated hydrogen peroxide were the main features of the recent symposium of the American Chemical Society.

Discussing the sulphur survey, Dr. J. R. West, of the Mellon Institute of Industrial Research, told the conference that, for the first time, all existing data on sulphur had been compiled into one publication, together with a graph of sulphur's thermodynamic properties.

"These data," said Dr. West, "should facilitate the engineer's work in the design of chemical plant equipment where sulphur is handled. In addition, this publication will help the scientist to recognise the inadequacy of the present information and may stimulate him to greater efforts in this direction."

Government Research Urged

Professor L. F. Audrieth, of the University of Illinois, urged Government support for research on vital nitrogen chemicals to bolster the country's peacetime economy as well as for national defence. Nitrogen, one of the few inexhaustible raw materials, because of the great potentiality of synthetic production, provided compounds essential in the manufacture of fertilisers, explosives, plastics, solvents, medicinals, and synthetic soaps.

"Certain nitrogen compounds, including ammonia and hydrazine, are actively being considered as fuels," he said. "With the necessity of conserving coal and petroleum supplies, it seems not unreasonable to consider these substances as alternative and special fuels."

Prof. Audrieth reminded the symposium that during the war the Germans experimented successfully with hydrazine, a watery liquid, as a power source for submarines. It is an excellent fuel, he said, because it burns with a hot flame and gives off no toxic fumes. Should a "National Science Foundation" be established in the U.S.A., funds for research on nitrogen chemistry might be made available through this agency, or it might even be desirable for the Government to set up research laboratories of its own, designed to facilitate fundamental investigations in this field.

Of the latest basic nitrogen chemicals, hydrazine and hydroxylamine, Prof. Audrieth said that ten years ago they were laboratory curiosities. To-day they were being manufactured in substantial quantities in the U.S.A. and their availability had stimulated a tremendous amount of academic and industrial research designed to increase their commercial potentialities.

Handling of Peroxide

Discussing problems arising from the handling of concentrated hydrogen peroxide, Dr. F. A. Gilbert, an official of the Buffalo Electro-Chemical Company, Buffalo, New York, said that close study had recently been given by peroxide manufacturers, transport undertakings and Government departments to determine the nature of the risks involved and methods of overcoming them. With the assistance of the U.S. Bureau of Explosives, manufacturers had produced special containers and these were expected to reduce transit risks.

Dr. Gilbert pointed out that the chief danger in handling hydrogen peroxide lay in its ability to generate large amounts of water vapour and oxygen at high temperatures.

Investigations had proved, he said, that if the material was correctly handled there was no abnormal risk.

Permanent Exhibition

No U.K. Exhibit at Brazil's World Fair

A "PERMANENT international industrial exhibition" was opened last week at Quitandinha, south of Rio de Janeiro. No U.K. exhibit, it was stated, had been prepared when the exhibition opened.

The exhibition is being organised in a series of 50-day periods and it is intended that for the next 10 years manufacturers of commodities ranging from heavy industrial equipment to domestic goods will have an opportunity of displaying their products.

According to Count Alexandre de Lasta, the exhibition's representative in London, although British industry was not represented at the opening ceremony, U.K. products will be arriving for exhibit in October and British manufacturers are already ordering display space.

The exhibition is being sponsored by the Brazilian Government which has passed a special law to facilitate arrangements regarding customs duties and currency exchanges. Goods imported into Brazil for display at the exhibition will not be subject to customs charges until they are actually sold.

American Chemical Notebook

From Our New York Correspondent

THE Rubber Development Bureau, which the British Rubber Development Board established in Washington last year, is sponsoring a campaign on a wide basis to promote a much wider use of latex foam as a cushioning material for domestic furnishings. Its use in public seating and transport cushioning is already widely adopted in the U.S.A. The domestic field, potentially the largest of all, is capable, it is thought, of providing a very great stimulus to natural rubber sales.

* * *

A New York estimate claims that the iron and steel industry makes use of nearly 5 billion gallons of water daily, or about 21 million tons. In the aggregate, this is a greater tonnage than all the raw materials used annually by the industry, according to the American Iron and Steel Institute. Water is used as a solvent, catalyst, conveying medium for the transport of materials and disposal of waste, a diluent or dispersive medium, cooling or cleansing agent, and in the production and distribution of heat and power. About 150 tons of water are used for every ton of finished steel the industry produces.

* * *

Claimed to be more efficient than its European counterpart because it produces 50 per cent caustic liquid directly at the cell and is cheaper to construct, the Mathieson Chemical Company's stationary mercury cell (THE CHEMICAL AGE, August 16, 1947) will soon be licensed for use abroad, said an official of the firm recently. The company has appointed a technical staff under the direction of Dr. William C. Gardiner, who completed development on the electrolytic cell, to advise prospective licensees on construction, installation and initial operation of the apparatus.

* * *

The Monsanto Chemical Company, St. Louis, Mo., has announced that commercial production of a new vinyl plasticiser, known as Santicizer 141, is now being undertaken. Output of the new product will be raised to 10 million lb. per year to partially meet the increased demands for plasticisers for the manufacture of vinyl films and mouldings. The new product is designed as a primary plasticiser for polyvinyl chloride and polyvinyl acetate film, sheet, and moulded articles, and is said to be suitable for use with a wide variety of resins. According to laboratory tests, Santicizer 141 can be safely handled during processing and its low temperature flexibility, together with high solvent and flame resistance, will enable it to be used in the production of curtains, table cloths, handbags and floor tiles.

* * *

Aroplaz 1081-M, a new alkyd soluble in mineral spirits, said to be compatible in all ratios with most melamine and urea resins, has been introduced by U.S. Industrials Chemicals, Inc., New York City. This high viscosity, medium-oil-length alkyd lends itself particularly well to industrial baking finishes, either alone or in combination with amine resins. It can be baked or air dried without amine resins for industrial goods and general utility finishes. This alkyd, it is thought, will enable economical production of high-quality finishes at considerably lower cost.

Competition for Aluminium

Dwindling Scrap Supplies in U.S.A.

OUTPUT of primary aluminium in the U.S.A. in April totalled 53,277 tons, an increase of 3 per cent on the March figures and the highest monthly total since August, 1944.

Announcing this, the U.S. Bureau of Mines stated that for the first time since April, 1947, sufficient power was available to keep most reduction plants in full operation, due to increased water supplies at the generating stations.

Scrap Prices Soar

The heavy demand for scrap aluminium continued its upward trend during April and, at the end of the month, prices of most secondary alloys were considerably higher than those for corresponding types of primary ingot—generally unobtainable. This situation has led the American Smelting and Refining Company, one of the country's leading refineries, to withdraw quotations on secondary aluminium ingot. An official of the firm said that the market no longer existed in the sense of supplies being available at reasonable prices.

Ingot Imports Drop

Imports of aluminium ingot into the U.S. in April, all from Canada, amounted to 5518 tons or 31 per cent less than in March and there was also a 12 per cent decline in the shipments of sheets, plates and strip. On the other hand, exports of alloy ingot and slab, principally to France and Germany, rose to 330 tons.

A MODEL RESEARCH CENTRE

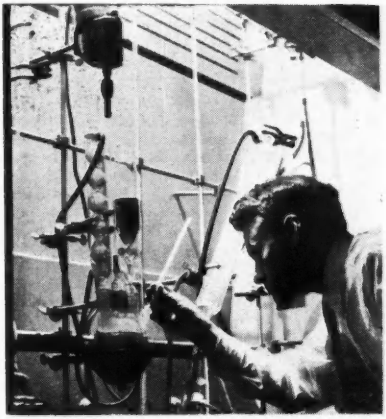
Wide Objectives of B. F. Goodrich Laboratories

A RESEARCH centre "which will make it possible to bring scientific discoveries to maturity three or four times faster than at present" has just been inaugurated at Brecksville, Ohio, by the B. F. Goodrich Company. At the opening ceremonies, John L. Collyer, president of the company, said that "the centre is, we believe, the most complete industrial workshop of science now in existence." The six buildings on the 261-acre site are all equipped with the latest scientific tools and equipment.

In addition to probing the technical problems of crude and synthetic rubber, the new centre will conduct intensive research in chemicals, plastics, agriculture, horticulture and the application of nuclear energy to rubber manufacturing. Atomic energy's usefulness and effects in rubber and related materials will be the special responsibility of one laboratory.

The main building is a three-story structure which contains no windows except at the ends of the hallways. It is 226 ft. wide, 172 ft. deep, contains 81 individual laboratories, a cafeteria, assembly hall seating 250, and a 10,000-volume library, the largest of its kind in the world.

Other units, isolated from main buildings, include one for extremely high pressure research, where 12-in. reinforced concrete barriers protect workers. Another is for experiment with gases and is equipped with continuous ventilation under pressure. The third is for storage of volatile solvents, and a fourth for cooling the water for air conditioning.



The research centre will be under the direction of Dr. Howard E. Fritz, B. F. Goodrich vice-president for research, in addition to whom there are now 100 chemists, chemical engineers, physicists and engineers on the staff, of whom three physicists and three chemists are women.

Features of the main research laboratories, one of which is shown here, are the rubber-topped benches and the specially designed hoods, which draw 75 per cent. of their atmosphere from outside. Above, right: watching a reaction in one of the well-lighted, hooded recesses

A CHEMIST'S BOOKSHELF

Chymia—Annual Studies in the History of Chemistry. Editor in Chief, Tenney L. Davis. 1948. Pennsylvania: University Press. London: Geoffrey Cumberledge, Oxford University Press; pp. xiv+190; price 20s.

It is singular that, at a time when many chemical concepts are undergoing change or are on the brink of it, in the light of new fundamental knowledge of the nature of matter, more than common attention is being paid to conjuring up the chemical ghosts of the past. While all eyes have in present circumstances more reason than ever to be focused on the immediate future, it is nevertheless not an inopportune moment to recall those who went before, both because of the true foundations on which the present edifice has been erected and for the false clues and occasional flashes of intuition which present knowledge has dismissed or triumphantly confirmed. We are indebted for the latest of the panoramas to the university workers of the U.S.A., an editorial committee of five under the editorship of Tenney L. Davis, of Norwell, Massachusetts, who have enlisted the distinguished support among science writers around the world, including F. Sherwood Taylor, J. R. Partington and John Read. The 13 sections preserve and revivify many of the long pursuits, in the course of which alchemy was transmuted into chemistry, and include in facsimile some entirely new documents relating to historical discoveries, and contemporary portraits and illustrations. The setting in which many of the events described took place was within these islands, although fitting record is included of some of the great workers in France and of some of the less tangible factors which aided Mendeleev in Russia clearly to formulate the periodic theory which several others, with the notable inclusion of J. A. R. Newlands in London, had so closely approached. Chymia, Vol. 1, as Eva E. Armstrong says in a foreword, is intended to promote international scholarship in the history of chemistry and to be a memorial to Edgar Fahs Smith, of the University of Pennsylvania, whose own devoted work as one of the all-embracing historians in that field is here engagingly recalled.

The Confessions of a Capitalist. Sir Ernest Benn. 1948. London: Ernest Benn, Ltd. Pp. 212; 8s. 6d.

Twenty-three years after they were originally published, most books concerned with contemporary affairs begin to take on an antiquarian flavour; others have no flavour at all. The thirteenth edition of this extremely individual testimony of one man's achievements, how they were brought about and the factors which aided them or sought to frustrate them, comes to-day as an even more apposite commentary on all our affairs than it was when it was written. Its re-publication in America and its translation into most of the Continental languages testify that its interest in the interval has not languished; now it has the additional great recommendation that the creed of personal responsibility and individual achievement, which it presents so well, is belatedly being recognised as our best hope of economic survival. These extremely frank and not at all humble "confessions," in their relation to current affairs, amusingly reflect one of those ironies with which historians are familiar. Much of the creed of this "reactionary" in 1925 has by imperceptible degrees been incorporated into Socialist Government policy of 1948. The posters of the Ministry of Labour and the National Savings Movement boldly proclaim the fruits of this miraculous conversion—on the road not to Damascus but to Marshall Aid. The text remains substantially unchanged and the author says in his preface to the 1948 edition: "It is my earnest hope that, in helping to explain the workings of private enterprise to a new generation, this book may encourage that spirit of personal risk and endeavour which never fails to show itself among Englishmen in a time of adversity."

Platinum Prices.—Following the rise in platinum prices recently announced in the New York market, one London firm is stated to have raised its spot selling rate from £20 to £22 15s. per troy oz. Last week Johnson, Matthey & Co., Ltd., stated its price for platinum metal was £19 10s.

Technical Publications

THE anxious attention which wartime shortage conferred on pyrethrum has left a legacy of interest in technical and production problems, which has now been recognised by the production of a specialised journal, *Pyrethrum Post*. This is the official publication of the Pyrethrum Board of Kenya, published from 2 Queen Anne's Gate, London, S.W.1, and provides in its first number a well presented and widely-based review of technical and cultural work on pyrethrum by authoritative contributors. Among the most interesting of these, from the specialised viewpoint of chemical industry, are the valuable comparisons between the activity of pyrethrum, derris powder and DDT as an insecticide in a particular field in the Belgian Congo (P. C. Lefevre) and a chemical evaluation of pyrethrum flowers designed to establish an international standard (H. E. Coomber, Imperial Institute).

* * *

A factor capable of having an important bearing on a subject of urgent interest, increased production of steel, is the subject of an expert description with illustrations, "The Temperature Measurement of Liquid Steel," in a folder issued by Tinsley (Industrial Instruments), Ltd. This briefly summarises the need for accurate measurement and the means adopted in the past, leading to the wide adoption of the platinum-platinum-rhodium thermocouple. This, lightly sheathed in silica, is capable of being plunged into liquid steel with a slag cover and withdrawn intact, providing an accurate temperature reading. On this principle is based the present installation produced by Tinsley, which, with the use of an amplifier, enables an accurate record (±2°C.) to be kept on large indicators at the furnace and on office recorder charts.

* * *

The use of stainless steel in the chemical and food-processing industries is adequately dealt with in an informative and well-illustrated article by Mr. J. A. McWilliam in the first issue of *Murex Review*, published by Murex, Ltd., Rainham, Essex. Future issues of this publication, at quarterly intervals, will contain other articles of interest to users of the firm's products and would-be contributors are invited to submit suitable material for consideration.

D

The Federated Metals Division of the American Smelting and Refining Company, 120 Broadway, New York 5, describes in a recent booklet properties and uses of its new aluminium alloy, Tenzaloy, containing 0.8 per cent copper, 0.8 per cent zinc, 0.4 per cent magnesium, and the balance aluminium. Its general characteristics are said to make it applicable where high strength and hardness in the "as cast" condition are desired. Its special features, of which 12 are described, are shown in figures and ageing curves when cast in sand and permanent moulds.

* * *

The Export Assistance Department of the National Union has prepared for its members a brochure for the guidance of those who contemplate entering the export trade for the first time or for those with little experience of overseas trade. The aim of the brochure is to direct the manufacturer to the sources of information regarding the many and varying aspects of the export trade rather than to provide a catalogue of circumstances which obtain at the moment.

The subjects dealt with include considerations of suitability of goods for various markets, how to sell the goods, the appointment of agents overseas, functions of merchants and agencies in this country, arrangements for payments, shipping, forwarding and insurance, the operation of the Export Promotion Department and Export Credits Guarantee Department, co-operation with other manufacturers, market research and advertising.

The brochure, in a limited edition, costs 10s.

Polyethylene Glycols

A recent development that has been translated to works production now makes available in commercial quantities a number of chemical esters, of an oily character, that dissolve clearly in water.

Chemically these products are polyoxyethylene oleates and laurates having a molecular weight above 800. They are non-ionic, non-toxic, light in colour and fluid or grease-like in consistency. They dissolve clearly in water, alcohol, esters, hydrocarbons and vegetable oils. At 20°C. they are slightly heavier than water. They all have high boiling points and exhibit surface-active properties. They are now being produced and sold by the Glyco Products Co., Inc., Brooklyn, N.Y.

PERSONAL

MR. DAVID JOHN GARRETT, iron manufacturer, Benvue, Biggar, Lanarkshire, formerly of Coatbridge, left £19,964.

MR. HARRY GREENWOOD, a director of Dunn Bros., Successors, Ltd., manufacturers of chemicals and coal-tar products, of Manchester, left £11,455 (net £11,389).

Audley Engineering Co., Ltd., Newport, Shropshire, announces that MESSRS. P. MEREDITH and J. W. TAYLOR have been appointed additional directors of the company.

MESSRS. W. A. ROBINSON and J. H. BAIRSTOW, both of whom have served Midland Tar Distillers, Ltd., Birmingham, for many years, have been appointed directors.

MR. HOWARD S. CRUMP has been appointed manager of the Liverpool branch of Brightside Foundry & Engineering Co., Ltd., in succession to MR. W. CLARE, who is retiring after 42 years' service.

The Secretary of State for the Colonies has appointed to the Board of the Colonial Development Corporation LORD MILVERTON, who retired last year from the Colonial Service, in which he had served for 40 years.

The University of Glasgow has awarded the Coats Fellowship, of the annual value of £300, tenable for two years, to MR. PATRICK A. ONGLEY, a graduate in Arts and Science, of New Zealand, who is a research student in chemistry at the University. This is the first award of the Fellowship recently instituted by Messrs. J. and P. Coats, Ltd., thread manufacturers, Paisley.

MR. W. J. MORRIS, research assistant in the physics department at Manchester Oil Refinery, Ltd., has been awarded the degree of M.Sc. for a thesis on "Jet Viscometers for High Rates of Shear." Another MOR recipient of the same degree is MR. W. F. MADDAMS, also of the physics department, for a thesis on the ultra-violet absorption spectrophotometric method for analysis of hydrocarbon mixtures.

MR. ASHLEY S. WARD, for many years chairman of Thos. Smith & Sons (Rodley), Ltd., crane and excavator makers, Leeds, has retired from the board. MR. F. H. SMITH also has relinquished his position as joint managing director, but remains on the board in an advisory capacity. New appointments are: Chairman and managing director, MR. F. R. STAGG; joint managing director, MR. W. H. SHARP; assistant managing director, MR. T. N. F. SMITH.

LEVERHULME RESEARCH AWARDS

The following names appear in the list of recipients of Leverhulme Research Fellowships, tenable for periods up to two years: J. EWLES, senior lecturer in physics, the University, Leeds — The luminescence of solids and of substances adsorbed on solids; J. C. ROBERTS, lecturer in chemistry, University College, Nottingham—The chemistry and bio-chemistry of moulds; E. B. MAXTED, special lecturer in catalysis, University of Bristol—Studies in catalyst poisoning.

OBITUARY

DR. FRANCIS W. GRAY, former lecturer in chemistry at Aberdeen University, died last week. A notable research worker and the author of a number of scientific publications, Dr. Gray retired from the University staff 12 years ago owing to ill-health.

New BWRA Council

At the annual general meeting last week of the British Welding Research Association, the following were re-elected members of council: MR. A. J. BOYD, Metropolitan-Cammell Carriage & Wagon Co., Ltd.; MR. H. W. CLARKE, James Booth & Co., Ltd.; SIR ANDREW MCCANCE, Colvilles, Ltd.; DR. J. H. PATERSON, Arc Manufacturing Co., Ltd.; MR. C. M. SPIELMAN, Whessoe, Ltd. COMMANDER SIR ROBERT MICKLEM and MR. V. E. GREENWOOD, who retired, were cordially thanked for their services and the following were elected new members of the council: MR. L. P. LORD, MR. F. C. MANNOX, MR. J. A. ORIEL, VICE-ADMIRAL SIR CHARLES SIMEON, MR. J. H. N. THOMPSON.

B.I.F. Bookings.—August 7 is the closing date for the receipt of applications for space at the 1949 B.I.F. (May 2-13), request for which shows signs already of considerably exceeding this or the preceeding year's records.

Parliamentary Topics

INSISTENCE by the Opposition that consumers should have free choice of electricity or gas, resulting in a vote against the Government, marked the third reading of the Gas Bill in the House of Lords. A clause to procure that option for the user was moved by Lord Rennell. Lord Lucas, for the sponsors of the Bill, said there was no provision to restrict the user's freedom, although there might be circumstances in which the Minister would see fit to issue directions for a small local gasworks that had become redundant to be closed down.

Viscount Swinton said it was a thoroughly bad case. The grandmotherly and universal interference with the way in which people wished to conduct their business, let alone occupy themselves in their own homes, had got beyond a joke. It was becoming an all-pervading menace. The claim that the Government should dictate what kind of fuel was to be used was intolerable.—The new clause was carried by 51 votes to 14.

Use of German Patents.—Asked by Mr. R. R. Stokes whether German patent rights were still protected outside Germany, and what notice has been taken of their value when assessing reparations from Germany the Under Secretary of State for Foreign Affairs (Mr. C. P. Mayhew) said: German patent rights in existence abroad on August 1, 1946, were German external assets to be liquidated in accordance with the terms of the Paris Conference on Reparation. The London Patents Accord of July 27, 1946, to which 28 nations were party, placed the majority of these patents in the public domain or made them available for royalty-free licensing, subject to certain exceptions. German inventions made after December 31, 1945, could be patented in the United Kingdom, United States and France and receive normal protection. Mr. Stokes further asked if the Under Secretary was aware that there had been a general stealing of design patents, with no regard paid to the value to the people from whom they have been stolen, "just as in the case of the Kalibri works, when tools were taken away and had to be returned because they had been stolen by competitors in this country." Mr. Mayhew said that the Kalibri works case had nothing whatsoever to do with the question.

Reduced Supplies of Sodium Chlorate.—Asked if he was aware that farmers were unable to obtain sodium chlorate for killing weeds, and what steps he was taking to make supplies available, Mr. J. Belcher said it had not been possible so far this year to secure in full the imports of sodium chlorate which normally supplemented home production, but he was hopeful of an early improvement in this respect. Meanwhile, on the advice of the Minister of Agriculture, he was arranging for as much sodium chlorate as possible to be reserved for the destruction of potato haulms and for weed killing on farm land. More would become available for the latter purpose as the demand for use on the potato crop diminished. Asked what increase had taken place in the production of sodium compounds, particularly soda ash, since the beginning of this year, Mr. Belcher said that there had been an increase of 6 per cent in the output of soda ash since January 1, 1948.

Groundnuts Scheme.—During a debate on food subsidies on Monday, Mr. J. Strachey, Minister of Food, said that while he could not forecast the costs of the groundnuts scheme or future groundnuts prices, both would be considerably higher than previous estimates. It was originally planned to produce groundnuts at £30 a ton for the first three years, dropping to £20. To-day, for certain marginal quantities, the Government was paying between £65 and £70. Main supplies, from Nigeria, were costing £41 per ton. The scheme would be producing commercial quantities next spring or early summer.

Malayan Rubber and Tin.—Owing largely to the fine efforts of the planters and smallholders in Malaya, the physical recovery of the rubber industry from the effects of the war is now virtually complete said Mr. Rees-Williams, Secretary of State for the Colonies. Production in 1947 was nearly 100,000 tons above the 1940 level. Satisfactory progress had also been made in rehabilitating the tin industry, but physical damage inflicted by the Japanese and shortage of steel and of electrical machinery had caused delay. All the hydraulic mines were working and 65 of the 100 dredges in use before the war were operating. The tin industry would receive the highest possible priority with regard to steel.

Coal Board's First Year.—The results of the first year's working of the National Coal Board were announced on Tuesday. The figures read: Tons sold 184,748,211; receipts £371,836,736; costs £381,040,641. Coal cost 41s. 3d. per ton to produce and sold at 40s. 3d. resulting in an average working loss of 1s. per ton totalling £9,203,905 for the year.

Home News Items

Shetland Peat Research.—Dr. N. W. Radforth, a Canadian scientist, is investigating peat deposits in Shetland on behalf of the National Research Council of Canada and other Canadian scientific interests.

Training for Engineers.—A new apprenticeship scheme, initiated by the Ministry of Supply, provides for the training of young graduate engineers who will be given essential practical experience for two years before entering specialised fields. After his course the apprentice may apply for entry to the Ministry's engineering pool or transfer to a commercial organisation.

International Road Federation. — The British Road Federation has become a founder member of the International Road Federation (European and Eastern Region), which was formed on June 25 when the Steering Committee, consisting of delegates of the road federations of France, Holland, Sweden, Switzerland and Great Britain, held a meeting in Paris. The new body will have its headquarters in London.

£160,000 More for Herring-Oil Project.—Announcement of a further grant of £160,000 in the Supplementary Civil Estimates, making £285,000 for herring-oil production plans, recognises the importance of this project in the Government plans and the determination to follow it to a successful finish. It is stated that the scope of the operations is to be largely expanded this year.

Unsettling Effect of P.T.—The Chancellor of the Exchequer is being asked by the National Union of Manufacturers that the new powers under the Finance Bill to vary purchase tax at any time by an Order shall not be used without consultation with the industry concerned. Retailers, it is pointed out, are unwilling under conditions of uncertainty to carry stocks of normal dimensions and the same conditions complicate the task of settling manufacturing programmes.

Import Regulations Listed.—The Board of Trade announces that a new consolidated list of import restrictions has been issued. This incorporates all amendments made to the former list which was issued in March, 1947, in so far as they are still operative. It is the Control of Imports into the United Kingdom, Notice to Importers No. 292 and is obtainable from the Import Licensing Department, Board of Trade, 189 Regent Street, W.1.

Record Steel Output.—Output of steel in June, announced the Iron and Steel Federation on Monday, was equal to a rate of 15,444,000 tons per annum and is the highest achieved in the history of the industry For the six months ended June 30 aggregate production totalled 7,564,000 tons, indicating an annual rate of 15,128,000 tons—well above the Government's higher target figure of 14.5 million tons.

Royal Visit to Colour Council.—Princess Elizabeth visited the headquarters of the British Colour Council, Portman Square, W.1., on July 7. The Princess displayed great interest in the various services undertaken by the council on behalf of British industry, including overseas markets research, and also saw preparations being made for the forthcoming exhibition of fashion colours.

U.S. Verdict.—A Scottish chemical exporter states that a U.S. client, writing after a recent visit to the U.K. and the Continent, says: "It was extremely surprising to me to find conditions on my trip to the Continent so much better than prevailed in England and Scotland, and, while it is apparently none of my business, it does seem to me that your system of regulations and restrictions on free enterprise is the wrong method of solving your post-war difficulties."

Pigment Firm's Jubilee.—Nearly 2000, consisting of employees, their wives and children, took part in celebrations held at Widnes on July 3 marking the 50th anniversary of the founding of Orr's Zinc White, a subsidiary of the Imperial Smelting Corporation. Presentations were made to 154 long-service employees, many of whom had been with the firm for more than 40 years. The company was incorporated on July 18, 1898, by Mr. John B. Orr, creator of Lithophone.

Private Imports of Tung Oil.—The Board of Trade announces that, as all Government stocks of tung oil have now been sold, full private trading is to be restored. Hitherto, traders have had to take one ton of Government stock for each two tons privately imported. Applications for import licences should be made as in the past to Import Licensing Branch, 189 Regent Street, London, W.1. The Board points out that the Control of Drying Oils (No. 1.) Order 1942 remains in force, however, and all who wish to acquire or use tung oil must be in possession of a licence under this order.

Overseas News Items

Fireworks Disaster.—Nine workers were killed and six others badly injured when a fireworks factory at Oberarth (central Switzerland) blew up on July 8. The factory's 15 workers were mostly women.

German Pyrites Supplies. — Production of pyrites in the British and U.S. zones of Germany is to be increased to about 360,000 tons this year to meet partially an essential total requirement of 930,000 tons. The deficiency will be made up by imports.

Increased Fertiliser Consumption. — The U.S. National Fertiliser Association states that American farmers used over 15 million tons of chemical fertilisers last year, compared with an annual average of 7.3 million tons during the years 1935-1939.

New U.S. Sulphur Mine.—Production has started at the Texas Gulf Sulphur Company's new mine near the Trinity River in Liberty County, Texas. Following 95 hours of steaming, the mine suddenly went into production. The new operation is the fourth Texas sulphur mine to be developed by the company since 1918.

S. African Chrome Mining.—A new development in the South African chrome mining industry is the recent amalgamation of the chrome interests of the Union Corporation and the African Mining and Trust Co., (Pty.). The new company will have available all the ores and concentrates produced in the Rustenburg and Lydenburg chrome mining areas.

Canadian Alcohol.—Mr. C. G. Kertland, president of Commercial Alcohols, Ltd., told shareholders of the company at the annual meeting here that its £2.5 million alcohol plant at Gatineau, Quebec, should be in operation this Autumn. Erecting costs would probably have increased 10 per cent. The company is also proceeding with the construction of its magnesia insulation plant, to operate next February or March.

Malaya Repeals Tin Duty.—In accordance with an agreement signed at Geneva last year, the duty of $30 per picul on Malayan tin ore, to other than Empire smelters, has been repealed as from July 31. It will then be possible for U.S. buyers to compete for the ore. Traders are asking how the removal of the duty will be reconciled with the allocations of the International Tin Committee and the Ministry of Supply's fixed buying price, which remains in force until June 1949.

Re-Named.—The American Foundrymen's Association, 52-year-old technical organisation of the castings industry, has decided to change its name to American Foundrymen's Society.

New Canadian Refinery.—Officials of the Imperial Oil Company announce that a new refinery at Edmonton has completed a satisfactory test run of its oil processing unit. Present planned output is 6000 barrels daily to be increased later to 11,000 barrels.

Montecatini Fertilisers.—The Montecatini Company has inaugurated a new large factory at Assisi for the production of sulphuric acid and chemical fertilisers. New plants have been built on the site of the old ones, destroyed in 1944, at a cost of 400 million lire.

Opportunity for U.K. Chemicals.—In the absence of the pre-war German supplies, the demand in Belgium for all fine chemicals, dyes, insecticides and pharmaceuticals has enormously increased. Manufacturers have not been slow to capture a share of this trade and in recent months the chemical group has held third or fourth place in the list of United Kingdom exports to Belgium—*Board of Trade Journal.*

German Oil Production Increasing.—German oil production in March aggregated 50,673 tons, compared with 46,173 tons in February. It is hoped to reach an annual output of crude oil of about 600,000 tons this year. Preparatory work in the Adorf oilfield in the Elmsland district of north-western Germany is stated to have proceeded so well that it will be possible to start production very soon.

Germany to Export Cement.— The Hanover Portland Cement factory Teutonia A.G. has obtained permission to manufacture cement for export. The works are at present running at 40 per cent of pre-war capacity, about 10,000 metric tons monthly. The output is to go, in the main, to Latin American countries. This is the first of the four cement factories located near Hanover to have resumed output.

Canada's Chemical Imports.—Imports into Canada of chemicals and allied products rose from $26.3 million in the same period of 1947 to $28.3 million, this year, according to the official survey of Canadian imports in the first three months of 1948. Proportionately the largest increases were in imports of iron and products (to $187.5 million) and non-metallic minerals and products (to $113.6 million).

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BRITISH ELECTRONIC APPLIANCES LTD. London, N.W. (M.17/7/48). June 7, £10,000 debs.; general charge.

GULA - KALUMPONG RUBBER ESTATES LTD. London, E.C. (M.17/7/48). June 9, charge, to Industrial Rehabilitation Finance Board, Sclangor, Malaya, securing all sums which the chargees may be called upon to pay under or by reason of a guarantee; charged on property known as Sungei Tawar Estate, Kuala Ketil. *Nil. October 2, 1947.

Satisfaction

BAIRD & TATLOCK (LONDON) LTD. chemists. (M.S.17/7/48). Satisfaction June 4, £2000, registered January 16, 1940.

Company News

Reckitt & Colman, Ltd. reports a trading profit for the year ended December 31, 1947, of £3,275,230 compared with £3,201,012 for 1946. A dividend of 20 per cent. is being recommended.

Sheepbridge Coal and Iron Co. shareholders have approved the proposal to change the company's name to Sheepbridge Company as it was considered the old title was no longer appropriate in view of the nationalisation of the coal industry.

The nominal capital of **Refinery (Holdings), Ltd.**, River Plate House, London, E.C.2, has been increased beyond the registered capital of £100 by £549,900, in 300,000 5½ per cent redeemable cumulative preference shares of £1 and 999,600 ordinary shares of 5s.

The Scottish chemical and scientific instrument firm of **Thomson, Skinner and Hamilton, Ltd.**, Sauchiehall Street, Glasgow, has been re-registered as a public limited company with a capital of £200,000. The directors are Messrs. Henry C. Lynton, William H. Lancaster, Robert W. Stewart and Charles Barclay, C.A.

The nominal capital of **Laboratory Supplies, Ltd.** 15 Central Chambers, Ealing Broadway, London, W.5, has been increased beyond the registered capital of £100 by £2900, in £1 ordinary shares.

New Companies Registered

Watts Chemicals, Ltd. (456,735).—Private company. Capital £10,000. Manufacturers exporters and importers of chemicals, drugs, medicines, etc. Solicitors: Buckeridge & Braune, 3/4 Clements Inn, W.C.2.

Solsway Plastic Laboratories, Ltd. (456,507).—Private company. Capital £10,000 Directors: H. Leigh and Frederic A. Axe, 108 Raleigh Drive, Frier Barnet, N.20. Reg. office: 8 Lytton Close, Alderney Gardens, Northolt, Middx.

A. S. Glues, Ltd. (456,748).—Private company. Capital £200. Manufacturers of chemicals, gases, glues, gums, etc. Directors: W. Smith, E. Smith. Registered office: "The Cullins," Leicester Road, Thurcaston, Leics.

Wrights Chemical Co., Ltd. (456,744).—Private company. Capital £100. Manufacturers of chemicals, disinfectants, fertilisers, salts, acids, etc. Directors: Wm. F. T. Wright, Sidney S. Pollard, Mrs Zillah Wright. Registered office: 90 Eden Street, Kingston-on-Thames, Surrey.

Bruno Court, Ltd. (456,373).—Private company. Capital £1000. Manufacturers of, and dealers in, essential oils, synthetic aromatics, essences, etc. Directors: Marie E. Bouge, Grasse, France; Philip T. Petley, London; Louis de Chauvigny, Touraine, France; and Lawrence V. Smith, Little Covert, Old Coulsdon, Surrey. Reg. office: 57 New Bond Street, W.1.

Chemical and Allied Stocks and Shares

BUSINESS in stock markets remained on a very limited scale, with small irregular movements in most sections. Last week's big withdrawals from National Savings affected sentiment in the gilt-edged market, where the Nationalisation stocks lost ground under the influence of the loss revealed by the National Coal Board accounts. Reports of a pending increase in the price of high grade coal used mainly by industry had an adverse influence on industrial shares, particularly as this will hit the export drive by stepping up production costs in the home market.

Chemical and kindred shares moved narrowly, with Imperial Chemical 46s.

pending the new issue terms; Monsanto Chemicals 5s. ordinary were 57s. 6d., Laporte Chemicals 5s. ordinary 20s., Amber Chemical 2s. shares 9s. 6d., and Albright & Wilson changed hands around 28s. In other directions, business in Fisons was around 57s. 6d., Burt Boulton & Heywood were 26s. 3d., but De La Rue receded further to 39s. Among other shares connected with plastics, British Industrial 2s. ordinary were 6s. 6d., and British Xylonite £5.

Borax Consolidated at 56s. 3d. regained part of an earlier decline, British Aluminium were 47s. 6d., and British Oxygen have come back to 95s., but Courtaulds firmed up to 37s. 7½d. after an earlier decline. In the building and allied groups, British Plaster Board (23s. 3d.) have strengthened on the strong position disclosed by the accounts. Uncertainty still persisting whether the Government will agree to re-opening the London Metal Exchange caused a partial reaction in shares of metal-dealing companies, although Amalgamated Metal, at 19s. 3d., were higher on balance, as were Metal Traders at 45s. Associated Cement firmed up to 73s. 3d., but Lewis Berger at £7⅞ lost part of an earlier rise. Units of the Distillers Co. have been steady at 25s. 10½d., with Turner & Newall firm at 74s., and United Molasses 46s. 4½d.

Iron and steels eased a few pence although it is generally believed in the City that any fair basis of compensation in the event of nationalisation would have to be above current market prices. In most cases the latter show generous yields on the basis of last year's dividends, and with steel production now at its record level, earnings are probably running well above last year's dividend rates. There is, of course, little prospect of higher distributions while the dividend limitation rule persists. It is being generally assumed that in any case nationalisation cannot be effected for at least two years. United steel were 27s. 6d., Dorman Long 29s. 6d., Colvilles 33s. 7½d., and Richard Thomas & Baldwins 6s. 8d. units changed hands around 13s. 7½d. In other directions, Babcock & Wilcox receded to 63s. 9d.

Glaxo Laboratories became steadier at £15¾, Staveley Coal & Iron were firm at 73s. 9d. on the market view that there are prospects of a partial return of capital to shareholders in the future, unless the company is planning further substantial acquisitions in the chemical industry. Triplex Glass 10s. ordinary units strengthened to 23s. 3d. on latest news of the company's products, including "curved" safety glass; but it is recognised in the market that dividend limitation will keep the dividend down to last year's 10 per cent. Oil shares were dull on the view that if the United States were to impose sanctions against the Arab countries the latter might cancel oil concessions. Anglo-Iranian eased to £8¼, Shell were 77s. 6d., and Burmah Oil 67s. 6d.

British Chemical Prices

Market Reports

A FIRM tone continues to be displayed in all sections of the chemicals market and buying interest has been sustained both for home trade and export. Deliveries under existing contract commitments are being called for in good volumes and in most cases requirements are being met with promptness though the supply position has not shown any noticeable improvement. Soda ash, bichromate of soda and chlorate of soda are in strong request and other items in the soda products section are being taken up to the full extent of the quantities on offer. The potash chemicals are finding a ready outlet at firm rates. Formaldehyde is a good market while a steady business has been done in practically all other items with nothing of outstanding interest to report. Pitch is again a good feature in the coal-tar products market and the creosote oils are enjoying a good demand and the overall position remains unchanged.

MANCHESTER. — In spite of seasonal holiday influences, steady trading conditions have been reported on the Manchester chemical market during the week. Textile chemicals are going forward in good quantities and a steady call for supplies against existing commitments is being dealt with from other industrial outlets. This applies both to light and medium products. Replacement business on home trade account during the past few days has been of fair extent and there has been no apparent easing in the flow of inquiries from shippers. The market is firm in pretty well all sections. In the tar products, a steady movement of supplies of creosote oil, carbolic acid and the light materials is reported.

GLASGOW.—Quiet conditions prevailed, due to the commencement of the Scottish holiday periods. Conditions are likely to remain quiet until next month, when the annual difficulty will arise of maintaining supplies when English suppliers are closed. In the export market conditions are fairly normal, a few orders again having been received. Generally, sales are on a scale smaller than at the same time of the year in previous years. There are definite signs of a shortage of money.

Johnson, Matthey and Co.

Value of Research

THE widening resources in the sphere of precious metals in the U.K., the U.S.A., Canada and, most recently, in Australia of Johnson, Matthey & Co., Ltd., were ably surveyed by the chairman, Mr. Hay W. P. Matthey, at the annual meeting of the company in London last week. Mr. Matthey, who lately completed 50 years service as a director, recalled that value of export sales in 1946 was 4½ times larger than the highest pre-war total: last year the total was seven times as great as that pre-war figure, in spite of currency restrictions, which were coming to be regarded as inevitable and permanent. He referred to the great technical advances he had seen during his long directorship, culminating in their present-day ability to refine platinum to 99.99 per cent purity and to roll and draw a billet weighing several pounds to an almost invisible wire .00025 in. in diameter. The company's intensive research into the dormant properties of precious metals had aided their greatly increased use in industry. As a result, silver, for example, had become an essential material for chemical plant, photographic emulsions, electrical contacts and condensers and many other products. The continued interchange of opinions between their research and production specialists had resulted in a steady flow of new products and processes.

The declaration of a final ordinary dividend of 3 per cent and a bonus of 6 per cent, making 12 per cent for the year, was approved.

£A25 Million for Science

INSTALLATION of a cyclotron at Melbourne is now being considered by the Australian Government as part of its defence plans, according to the Australian News and Information Bureau in New York. Mr. John J. Dedman, Minister of Defence, said that atomic research was only one of many defence proposals now being considered by the Federal Government in close co-operation with Great Britain. It is reported that approximately £A200 million has been allocated for a five-year defence programme, of which more than £A25 million would be devoted to scientific research. A big proportion of this would be spent on the Australian rocket range, and the balance used on defence activities which are still in the "top secret" category.

Big Buyers Arrive

EVIDENCE of good prospects of increased transatlantic sales of U.K. chemicals, machinery and other goods was offered by several of the passengers who arrived at Liverpool on the *Empress of Canada* on July 10. Mr. Herbert H. Lank, vice-president of the sales department of Canadian Industries, Ltd., let it be known that he wanted chemicals, of many categories, in very large quantities. He was dressed almost entirely in nylon, his outfit including Canada's first nylon raincoat, weighing 5 oz. Other arrivals included Mr. George P. Granell, of Toronto, who is prepared to spend $1 million on steel and rolling mill machinery; Mr. Keith Jopson, Britain's senior trade commissioner in Montreal and economic adviser to the High Commissioner, who said the Canadian Government urgently wants more Lancashire textiles; and Mr. Frederic Warren, president of the Canadian Chamber of Commerce in Britain, returning from the Toronto Fair, who said there is a great desire to buy British, "the only complaint being high prices."

New Rayon Research Centre

A PORTION of a former aircraft factory at Barton, near Manchester, is shortly to be converted into temporary laboratories by the British Rayon Research Association.

An official of the association said last week that it was hoped later to secure permanent premises on the south side of Manchester, but accommodation difficulties had prompted part-tenancy of the factory as a temporary measure.

The establishment of a research centre coincides with the 50th anniversary of the commercial marketing of rayon in Britain. Since 1930, British rayon production has grown from 48 million to more than 200 million lb., and the value of British rayon exports to-day approaches £20 million.

NEXT WEEK'S EVENTS

TUESDAY, JULY 20 to THURSDAY, JULY 22

Institution of Electronics (North West Branch). College of Technology, Manchester. Third annual exhibition.

WEDNESDAY, JULY 21

British Standards Institution. Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, 3.0 p.m. Annual general meeting.

Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patent Office, Southampton Buildings, London, W.C.2, at 1s. each. Higher priced photostat copies are generally available.

Complete Specifications Accepted

Process for separating by liquefaction gaseous mixtures into their constituents.—Air Liquide, Soc. Anon. pour L'Etude et L'Exploitation des Procedes G. Claude. Dec. 19, 1940. 603,249.

Process of manufacture of glycol.—Solvay & Cie. Dec. 24, 1942. 603,256.

Vat dyestuffs of the anthraquinone series.—I.C.I., Ltd., F. Irving, and A. Livingston. Oct. 18, 1945. 603,317.

Manufacture of acyloxy-carboxylic acids.—Howards & Sons, Ltd., R. H. Lock, and R. Heap. Oct. 22, 1945. 603,189.

Oil phase polymerisation.—United States Rubber Co. Dec. 30, 1944. 603,324.

Oil phase polymerisation.—United States Rubber Co. Dec. 30, 1944. 603,325.

Production of holes in sintered powdered metal articles.—London Electric Wire Co. & Smith, Ltd., A. Kelly, and A. B. Ashton. Nov. 15, 1945. 603,123.

Manufacture of articles from polymers or copolymers of vinyl chloride.—Soc. Rhodiaceta. Aug. 4, 1944. 603,040.

Method of charging vertical blast holes with liquid oxygen explosives.—Air Liquide, Soc. Anon. pour L'Etude et L'Exploitation des Procedes G. Claude. Nov 6, 1944. 603,045.

Method for the removal of solid carbonaceous deposits.—Air Liquide, Soc. Anon. pour L'Etude et L'Exploitation des Procedes G. Claude. Nov. 8, 1944. 603,046.

Centrifugal speed governors for electric motors.—Air Liquide, Soc. Anon. pour L'Etude et L'Exploitation des Procedes G. Claude. Dec. 14, 1944. 603,047.

Manufacture of stilbene dyestuffs and of starting materials therefore.—J. R. Geigy, A.G. Nov. 24, 1944. 603,267.

Process of preparing chlorites from chlorine dioxide.—N.V. Koninklijke Nederlandsche Zoutindustrie. Dec. 31, 1942. 603,338.

Process for making selenium dioxide.—E. P. Newton. Dec. 11, 1945. 603,133.

Method of preparing an anti-hemorrhagic preparation.—Abbott Laboratories. Dec. 29, 1944. 603,206.

Production of morpholine salts of sulphonated azo dye components.—Marconi's Wireless Telegraph Co., Ltd. Dec. 21, 1944. 603,280.

Production of organic nitro compounds.—E. I. Du Pont de Nemours & Co. Dec. 22, 1944. 603,344.

Manufacture of biguanide derivatives.—I.C.I., Ltd., S. Birtwell, A. F. Crowther, F. H. S. Curd, J. A. Henry, D. N. Richardson, and F. L. Rose. Jan. 7, 1946. 603,069.

Manufacture of biguanide derivatives.—I.C.I., Ltd., A. F. Crowther, F. H. S. Curd, J. A. Hendry, and F. L. Rose. Jan. 25, 1946. 603,070.

Centrifugal pumps. Tecalemit, Ltd., and C. C. S. Le Clair. Jan. 28, 1946. 603,071.

Manufacture of wax articles.—Metropolitan-Vickers Electrical Co., Ltd., and J. S. Turnbull. March 5, 1946. 603,072.

Degassing of metals or metal alloys.—Foundry Services, Ltd., and K. Strauss. July 24, 1945. 603,213.

Arc carbon anodes.—Soc. le Carbone-Lorraine. Dec. 12, 1938. 603,564.

Rotors for compressors, turbines and the like.—Power Jets (Research & Development), Ltd., and L. T. Whitehead. March 8, 1945. 603,578.

Lactones of 2-methyl-3-hydroxy (and alkoxy)-4-caroxy-5-hydroxymethyl - pyridine.—Merck & Co., Inc. May 27, 1944. 603,442.

Method and apparatus for the production of pulp from cellulosic material.—J. B. Beveridge, and R. D. Kehoe. Jan. 26, 1942. 603,447.

Apparatus for utilisation of medicinal aerosols.—Soc. Anon. Teco. Oct. 4, 1941. 603,455.

Process of extracting iron from iron silicates or iron ores containing silica.—Orkla Grube-A. June 17, 1943. 603,366.

Production of light density polymeric materials.—Expanded Rubber Co., Ltd., and S. Booth. Oct. 19, 1945. 603,402.

Process for the hydrolysis of 2, 5-dihydrofurans.—I.C.I., Ltd., and D. G. Jones. Oct. 22, 1945. 603,422.

Treatment of gases or vapours with liquids.—I.C.I., Ltd., and O. G. Dixon. Oct. 22, 1945. 603,423.

Method for making anthrimides.—E. I. Du Pont de Nemours & Co., J. M. Tinker, and O. Stallmann. Oct. 22, 1945. 603,495.

Process for manufacturing pentanthraquione-tetracarbazole.—E. I. Du Pont de Nemours & Co., J. M. Tinker, O. Stallmann, and P. J. Wingate. Oct. 22, 1945. 603,496.

Concentration of ethylbenzene.—Distillers Co., Ltd., and F. E. Salt. Oct. 22, 1945. 603,497.

Chloro-ethylation of alkylated benzene compounds.—Distillers Co., Ltd., E. G. Galitzenstein, F. E. Salt, H. M. Stanley, and T. Weir. Oct. 22, 1945. 603,498.

Manufacture of soap from sperm oil.—A. Abbey. (Compania Industrial Soc. Anon.) Oct. 23, 1945. 603,529.

Method of and means for condensing corrosive vapours.—Soc. Pour L'Exploitation des Procedes Ab-Der-Halden. April 24, 1942. 603,598.

Process for the manufacture of acridine compounds.—E. P. Newton. (Parke, Davis & Co.) Oct. 23, 1945. 603,533.

Removal of impurities from water or aqueous liquids.—Permutit Co., Ltd. (Permutit Co.) Oct. 23, 1945. 603,534.

Process for the manufacture of an imidazolidone derivative.—F. Hoffmann-La Roche & Co., A.G. Nov. 20, 1944. 603,536.

Process for the manufacture of 1-*d*-ribitylamino-3.4-xylol. F. Hoffmann-La Roche & Co., A.G. Nov. 24, 1944. 603,537.

Oil phase polymerisation.—United States Rubber Co. Dec. 30, 1944. 603,546.

Manufacture of laminated products.—Bakelite, Ltd. Nov. 2, 1944. 603,562.

Production of aryl trihalogenoethanes.—Geigy Co., Ltd., I. E. Balaban, and F. K. Sutcliffe. Oct. 29, 1945. 603,685.

Production of vinyl cyanide.—I.C.I., Ltd. Oct. 27, 1944. 603,699.

Production of vinyl cyanide.—I.C.I., Ltd. Oct. 27, 1944. 603,700.

Manufacture of derivatives of di-substituted methane compounds.—Ward, Blenkinsop & Co., Ltd., and G. J. Pritchard. Oct. 30, 1945. 603,616.

Preparation and use of substituted methane compounds.—Ward Blenkinsop & Co., Ltd., and G. J. Pritchard Oct. 30, 1945. 603,463.

Production of vinyl ethers and their homologues.—Distillers Co., Ltd., P. L. Bramwyche, and M. Mugdan. Dec. 12, 1945. 603,471.

Process for sensitising rubber latex.—F. Chassaing. Jan. 9, 1945. 603,628.

Method of bonding rubber and synthetic rubber to metal.—Firestone Tyre & Rubber Co. Dec. 18, 1944. 603,631.

Interpolymers.—E. I. Du Pont de Nemours & Co. Jan. 31, 1945. 603,481.

Interpolymers.—E. I. Du Pont de Nemours & Co. Jan. 31, 1945. 603,482

Manufacture of polymethin dyes and photographic emulsions containing the same.—Kodak, Ltd. (Eastman Kodak Co., L. G. S. Brooker, and F. L. White.) Aug. 28, 1944. 603,492.

Process for recovering magnesium salts.—Idaho Maryland Mines Corporation. Oct. 23, 1942. 603,779.

Separating dust from gases.—British Filters, Ltd., and T. C. Worth. Oct. 19, 1943. 603,704.

Manufacture of heat and sound insulating masses composed of foam built up on a basis of artificial resin.—Ciba, Ltd. July 28, 1944. 603,790.

Process for the simultaneous manufacture of bicarbonate of magnesium and of ammonium magnesium phosphate.—C. d'. Asseev. Jan. 12, 1944. 623,794.

Drying of hydrous oxide gel particles.—J. C. Arnold. (Standard Oil Development Co.) Sept. 14, 1945. 603,729.

Purification from compounds of sulphur, phosphorus and/or arsenic of gases inactive to chlorine.—Solvay & Cie. Dec. 18, 1943. 603,735.

Rolling mills.—I.C.I., Ltd., and S. S. Smith. Oct. 30, 1945. 603,752.

Azo dyestuffs.—I.C.I., Ltd., G. T. Douglas, A. Parkinson, and H. Wakefield. Oct. 30, 1945. 603,753.

High temperature elastic fluid turbines.—British Thomson-Houston Co., Ltd. (General Electric Co.) Oct. 30, 1945. 603,798.

Method of softening and de-aerating water, and particularly boiler water.—Produits Chimiques de Ribecourt. Nov. 21, 1944. 603,802.

Catalytic treatment of sulphur-bearing hydrocarbon distillates. — Shell Development Co. Dec. 21, 1944. 603,808.

Production of unsaturated halogenated hydrocarbons.—Shell Development Co. Dec. 19, 1944. 603,809.

Hydrolysis of acetone auto-condensation products.—Shell Development Co. Dec. 5, 1944. 603,810.

Process for the manufacture of quaternary pyridinium salts.—Roche Products, Ltd., F. Bergel, A. Cohen, J. W. Haworth, E. G. Hughes, and J. A. Silk. Oct. 30, 1945. 603,811.

Production of allyl alcohol.—Carbide & Carbon Chemicals Corporation Jan. 16, 1945. 603,815.

Plasticised synthetic resin compositions.—Distillers Co., Ltd., D. Faulkner, H. M. Stanley, and J. J. P. Staudinger. Oct. 30, 1945. 603,817.

Manufacture of acetonitrile.—I.C.I., Ltd., and H. R. C. Pratt. Oct. 31, 1945. 603,823.

Manufacture of acetonitrile.—I.C.I., Ltd., and H. R. C. Pratt. Oct. 31, 1945. 603,824.

Hydrogenation of organic compounds.—E. I. Du Pont de Nemours & Co Nov. 1, 1944. 603,825.

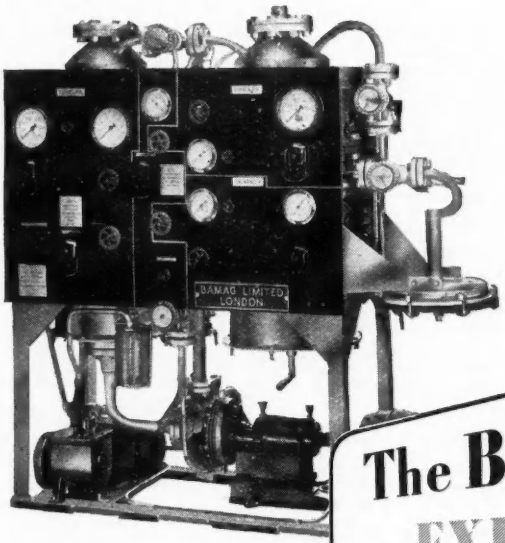
Production of fluorohydrocarbons.—I.C.I., Ltd. Nov. 1, 1944. 603,855.

Polyformals.—I.C.I., Ltd. Nov. 2, 1944. 603,872.

Compositions comprising acrylonitrile polymers and copolymers and shaped articles produced therefrom.—E. I Du Pont de Nemours & Co. Nov. 4, 1944. 603,873.

Coloured cellulose ester and ether materials.—H. C. Olpin, and K. R. House. Nov. 2, 1945. 603,880.

Manufacture of interpolymers.—E. I. Due Pont de Nemours & Co. Nov. 7, 1944. 603,952.



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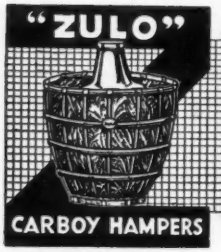

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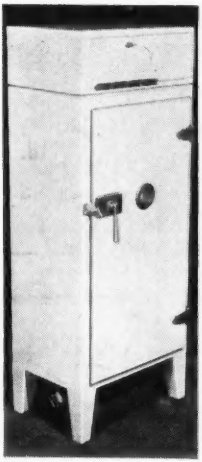

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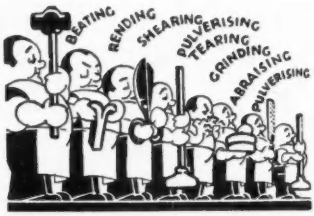

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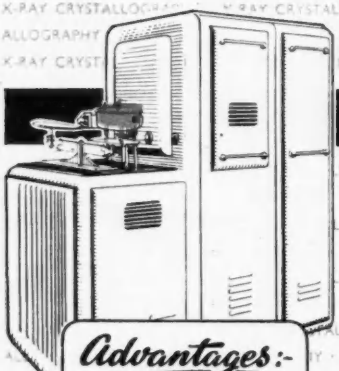

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